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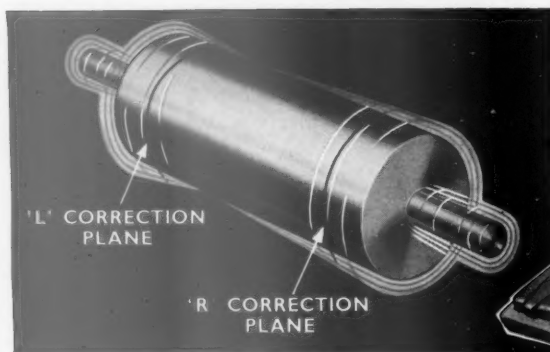
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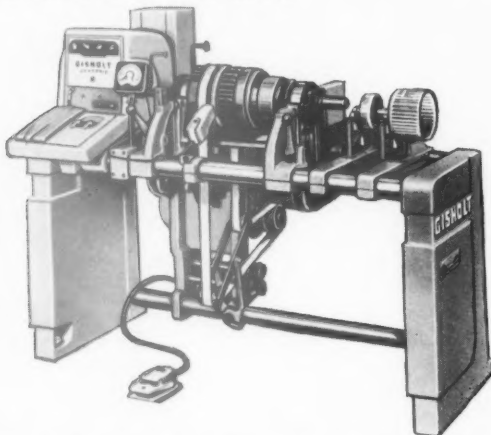
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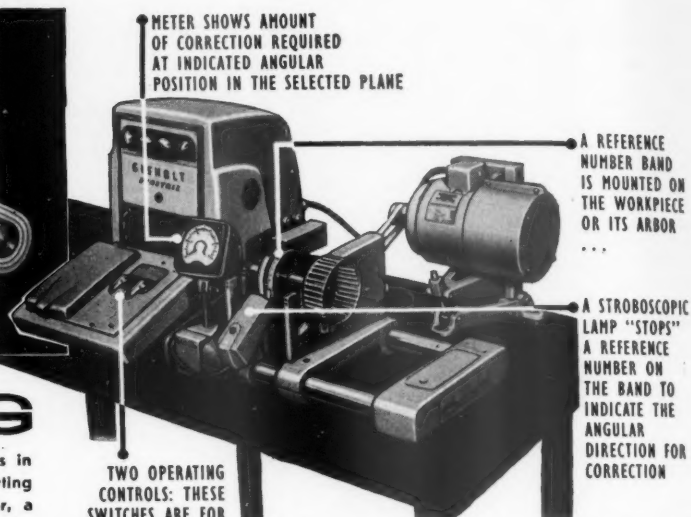
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Higher Status for Export Credits Department

THE provision of export finance and the related guaranteeing of credits in export transactions is vitally important to British manufacturers of locomotives and rolling stock, and any step is welcome which results in the better functioning of the Export Credits Guarantee Department of the Board of Trade. It is gratifying that, on the advice of a committee under the chairmanship of Sir Eric Speed, the Government has decided that the status of the Department is to be enhanced, so that senior posts can be filled from a wider choice of experienced men and provide better prospects of a career. This is because of the increased weight of business transacted by the Department, which has increased tenfold since 1946. Accordingly the head is to be designated Secretary, responsible directly to the President of the Board of Trade; he will be assisted by two Under Secretaries. The choice of Secretary is Mr. L. J. Menzies, an Adviser to the Governors of the Bank of England; one factor in his selection was the Government's view—and a right one—that the Secretary should have practical experience in the City of London, with the knowledge of the world of com-

merce and industry which that implies, but is necessarily denied to civil servants. The Under Secretaries are to be Mr. A. E. Percival, of the Board of Trade, and Mr. A. T. K. Grant, of the Treasury. The upgrading of the Department moreover means that its views will carry more weight with Ministers and with the other Government departments concerned. It is hoped that the wider experience and greater influence now being acquired by the Export Credits Guarantee Department will result in greater flexibility, more especially in the terms of credit. Competing industries in other countries have had very considerable backing in this respect from their Governments or from public corporations guaranteeing credits; this often has enabled them to quote longer or more attractive terms than the British Government has thought desirable—with consequent loss of export trade for British manufacturers, including supplies of railway material. In such instances it is often better to take risks, which will be appreciated by a business man rather than by a civil servant. The Government also has adopted the Speed Committee recommendation that insurance for export credit should be conducted by a Government department, rather than through a statutory public corporation, as in some countries, because public funds are involved, the work is related to broader aspects of economic policy, and the E.C.G.D. depends on information from Government sources. This at least avoids the upheaval associated with change, and seems a sound decision, provided that the British export industries are given proper support.

Mr. R. C. Bond

THE many problems recently confronting the British Transport Commission cannot have included the choice of a successor to Mr. J. Ratter, Technical Adviser to the B.T.C., whose appointment as Member was recorded last month. Mr. R. C. Bond, Chief Mechanical Engineer of British Railways Central Staff, who takes up the appointment on October 1 this year, combines first-class administrative ability and extensive practical engineering experience with the strength of character essential to the holder of high office. His whole career—comprising nearly 40 years of service within the railway framework and in industry—has been gained in motive power work. His experience has been wide: as Assistant Works Manager with Vulcan Foundry Limited he supervised the erection in India of main-line electric locomotives for the Great Indian Peninsula Railway, and as Chief Officer (Mechanical Engineering) in the interim organisation of British Railways he overcame the difficulties of standardisation of steam equipment. This experience undoubtedly will prove of value during the inevitable extension of standardisation of the latest forms of motive power on British Railways, the intelligent application of which will play so vital a part in the national economy.

The Late Mr. Arthur Moss

THE passing of Mr. Arthur Moss, so soon after retiring as Signal Engineer to the Eastern Region of British Railways, will awaken deep regret in signalling and operating circles and in the associated industries, throughout which he was held in high regard. Entering signalling work under the late Mr. A. F. Bound on the Great Central Railway he became associated with pneumatic and all-electric signalling, early intermediate section signalling, the wider use of track circuiting at ordinary signalboxes, the introduction of three-position semaphores, long-distance point operation and other developments. He early became an advocate of relay interlocking and champion of the panel against the power-lever frame, finding particular satisfaction at being concerned with its application to Liverpool Street terminus and approach lines. He was a constant and forthright debater at meetings of the Institution of Railway Signal Engineers, of which he was President for 1948 and for which he did much other work in the endeavour to advance the interests of, and increase respect for, the profession to which he was so proud to belong.

Overseas Railway Traffics

PARAGUAY Central Railway receipts continued to decline in comparison with the 1957 equivalents and, at the end of the financial year on June 30, aggregate receipts showed a decrease of G5,377,084 compared with the previous year. Receipts during the year 1956-57, however, were generally higher than average and the decrease does not, therefore, indicate the true state of finances. After the first two weeks of the 1958-59 financial year, aggregate receipts showed a decrease of G1,176,102 compared with the corresponding period of last year. Salvador Railway Company receipts for May were colones 217,000 compared with colones 255,000 for May, 1957. Aggregate receipts for the period July 1, 1957, to May 31, 1958, were colones 2,561,000 compared with colones 2,953,000 for the corresponding period of 1956-57, a decrease of colones 437,000. Costa Rica Railway receipts for June were colones 1,979,947 compared with colones 2,079,792 in June, 1957, a decrease of colones 99,845. Aggregate receipts for the year ended June 30, 1958, were colones 23,023,405 compared with colones 20,204,891 for 1956-57, an increase of colones 2,818,514.

Value of Apprentice Training Schemes

THE value of properly organised apprentice training schemes is now recognised by many branches of engineering in this country, not least on British Railways, as shown by the number of apprentice training schools which have been instituted at many large railway centres since the war, more particularly in the London Midland Region. At the opening ceremony of the new L.T.E. Underground apprentice training centre at Acton Works on August 7, by Sir John Elliot, Chairman of the London Transport Executive, he spoke of the "very great importance to the L.T.E. of this small building." Sir John Elliot fully recognises the use of such establishments; when a senior officer of British Railways he instigated the formation of a training school at Crewe Works. The school at Derby, he pointed out, had ensured a good flow of men into the Derby Works, but Crewe had always been short, and he had therefore advocated a school at Crewe. Although the L.T.E. training curriculum will not be altered to any great extent, the new premises at Acton will make possible concentration of previously scattered training facilities. There is an advantage in being able to ensure that each apprentice passing through these and similar works is able to obtain a consistently high standard of workshop training from qualified instructors, instead of being at the mercy of the whim of the skilled tradesman, however efficient, to instruct correctly the apprentice with whom he may happen to be working.

Three Diesel Prototypes for British Railways

INTRODUCTION of diesel motive power on British Railways continues apace. Three prototype designs appeared this week, two railbuses and one mixed-traffic locomotive. One railbus has been built by Park Royal Vehicles Limited, and the other by British Commercial Vehicles Limited in conjunction with Eastern Coach Works Limited, both members of the Tilling Group of companies and thus owned by the British Transport Commission. A feature of the Park Royal bus is the body-to-underframe suspension based on the Uerdigen system, popular on the Continent, of which British United Traction holds the British licence. The Bristol vehicles incorporate details not seen hitherto in railbuses constructed for British Railways. They include the floor set lower than standard, at 7 in. above platform level; resilient wheels; and a form of disc brake, in which the main braking effort is controlled by a monitor wheel rim brake shoe. Railbuses have been introduced in comparatively large numbers particularly in Central Europe, in many cases with considerable success, but it remains to be seen how far this form of passenger transport will prove attractive to the travelling public in Britain, largely because stations are not always conveniently situated. The locomotive is the North British/

G.E.C. diesel-electric 800-h.p. Type "1," of which 10 are on order for the Eastern Region. They incorporate automatic control of field weakening on every engine power notch, permitting maximum use of engine power over a wide range of locomotive speeds. Reference to these three prototypes is made elsewhere in this issue.

Diesel Trains in the N.E. Region

THE suitability of interurban passenger services for remunerative operation with diesel sets is shown by the additions next Monday, to diesel services in the North Eastern Region. The first, and outstandingly successful, use of the new series of diesel railcars and multiple-unit trains being placed in service on British Railways—subsequent, that is, to the highly successful G.W.R. and Western Region ventures—was between Leeds and Bradford and Harrogate in 1954. Since then many diesel services have been introduced in the North Eastern Region, and further diesel trains are now to operate on the York-Harrogate, Newcastle-Sunderland, and Sunderland-South Shields lines; and a few steam trains on other services also will be replaced by diesels next week. The York to Harrogate service is to be worked by four-car units built by the Birmingham Railway Carriage & Wagon Co. Ltd. and the others by the two-car sets supplied by the Metropolitan-Cammell Carriage & Wagon Co. Ltd. and by Cravens Limited. These products of British builders are deservedly popular with the travelling public, besides having proved most efficient as regards performance and maintenance.

Long-Welded Rails on British Railways

THE decision by the British Transport Commission to install long-welded rails on main lines throughout the country as track renewals become due, will add much to passenger comfort and afford substantial economies in maintenance. Such rails need a special technique in maintenance, and the full extent of the economies have yet to be established; but rail-end failures on line laid with standard 60-ft. rails, are stated to account for 25 per cent of normal permanent way maintenance. Long-welded rails are built up in the depots from 60-ft. lengths of British Railways standard flat-bottom rail, flash-butt welded into lengths of 300 ft., convenient for movement to site. When the 300-ft. lengths have been positioned in the track, the ends are welded into continuous lengths of a quarter-of-a-mile or more. Various methods of welding have been used by railways throughout the world including electric arc, thermit, oxy-acetylene, and flash-butt, but universal preference now seems to be for flash-butt welding. To accelerate British Railways installation programme, four new rail-welding depots are to be established at Castleton near Manchester, Dinsdale near Darlington, Hookgate near Shrewsbury, and at Motherwell. It is estimated that about 170 miles of long rails will be laid in 1959 in replacement of existing track, as it becomes due.

More Diesel Locomotives for British Railways

THE order placed by the British Transport Commission for 33 2,000-h.p. Type "4" diesel-hydraulic locomotives, reported in the Contracts and Tenders section this week, represents the final instalment of a scheme for the complete replacement of over 200 steam locomotives by 129 diesel-hydraulic locomotives on services west of Newton Abbot in the Western Region, and on many through trains between Paddington, Bristol, and the West of England—the largest replacement of steam by diesel traction on a main line to take place in this country. The locomotives will be built by the North British Locomotive Co. Ltd., which has already received contracts for 58 1,000-h.p. and five 2,000-h.p. diesel-hydraulic locomotives ordered for this purpose; the remaining 33 of 2,000 h.p. are being built at British Railways Swindon Works. Of contracts placed by the B.T.C. for diesel-electric locomotives, one is a repeat order for 30 Type "4" English Electric Co. Ltd. units of 2,000 h.p. These have proved

themselves on the Great Eastern line of the Eastern Region where they are successfully operating accelerated express passenger services between London and Norwich. The 30 locomotives now ordered, which will be allocated to Regions where improved main-line services are most desirable, will be built by the Vulcan Foundry Limited, Newton-le-Willows, a member of the English Electric Group.

Starting Against the Fixed Signal

THE collision between an electric train and a light engine at Staines Central on August 9, 1957, was due to the motorman accidentally leaving the platform against the fixed signal on receipt of the "right away" from one of the station staff, the guard's signal having to be relayed forward as the platform is curved. Brigadier C. A. Langley, whose report on the case we summarise in this issue, refers to the question from time to time discussed, of the possible tendency of a "right away" hand signal to lead to disregard of the fixed one. He does not consider it advisable to change long established rules but recommends in this particular case adding a repeater indicator under the platform awning, more especially as a circuit exists, leading to a banner signal, to which it could readily be connected. Staines was one of the L.S.W.R. stations worked for many years on the low-pressure pneumatic power system, installed in 1903.

Southern Region Traffic Organisation

IN the Southern Region, and, before nationalisation, on the Southern Railway, operating and commercial matters in the five districts, or divisions as they were termed on the Southern Railway, have been the responsibility of one officer, known today as the District Traffic Superintendent. The new Southern Region traffic organisation, which very broadly resembles those in operation or in course of formation in four other Regions of British Railways, calls for less change of ideas than there has been or is in Regions where there were formerly separate commercial and operating officers in the districts. The amalgamation, in 1923, of the three railways, the South Eastern & Chatham, the London Brighton & South Coast, and the London & South Western, with subsequent retention of their identities, roughly, in certain groups of lines for traffic purposes, which has persisted because it is the rational organisation in relation to the origin and flow of traffic, has made it easier to divide the Region into three Traffic Divisions: the South Eastern; the Central; and the South Western, corresponding roughly to the three constituents of the Southern Railway—with obvious adjustments, as of the S.E.C.R. Reading branch.

The aim of the new organisation is to afford more effective decentralisation in day-to-day work and to simplify the traffic organisation at headquarters; in these two objectives it resembles those in other Regions. A third objective, not so much emphasised by the Area Boards of other Regions in announcing their decisions to re-organise the traffic departments, is the special attention to be given to a study of long-term trends in population and in industrial and business activity under a Chief Development Officer. This is a sphere which has always, and rightly, been given importance by the Southern Region and Southern Railway, with some fruitful consequences, notably in selecting lines to be electrified so as to cater for expected quantities of passenger traffic, and in the various steps in developing Southampton Docks.

For traffic purposes the Region will be divided into three Divisions, the South Eastern, equivalent to the territory of the present London (Eastern) District; the Central, to that of the London (Central) District; and the South Western, covering the territories of the present London (Western), Southampton, and Exeter Districts. Each Division will be under the control of a Line Traffic Manager; he will be responsible for the operating and commercial work on his Division, including timetabling, and those functions of the former Motive Power Department which are now the responsibility of the Operating

Department. At headquarters there will no longer be separate Operating and Commercial Departments; the work of the Line Traffic Managers will be co-ordinated by an Assistant General Manager (Traffic), who will be assisted by an Operating, a Commercial, and a Motive Power Officer. At headquarters also the small team under the Chief Development Officer, Mr. W. H. F. Mepsted, at present Chief Commercial Manager of the Region, is to be set up to undertake a study into long-term trends to facilitate planning in relation to traffic trends.

The new organisation will be introduced in stages, the first stage beginning on October 5, when the Assistant General Manager (Traffic) will take over his duties; Mr. S. A. Fitch, at present Chief Operating Superintendent, has been appointed to the post. On the same date, the first of the new Traffic Divisions, the South Eastern, will come into being; Mr. P. A. White, now Assistant Operating Superintendent, Modernisation, at Regional headquarters, has been appointed Line Traffic Manager (South Eastern). He will have his own offices in the City of London at 61, Queen Street, next to Cannon Street Station. This location of traffic offices on central, and valuable, sites in a busy commercial area is in accordance with practice in other Regions. Even although the resultant expenditure on premises may be relatively high, this may be compensated by greater accessibility to many potential railway users. It was entirely right to choose the London (Eastern) District, whose headquarters, as a result of an enforced wartime move for safety reasons, are in inadequate and remote premises at Orpington, as the first Division to be formed. It is the largest and busiest district in Britain and, we believe, in the world. Besides its intensive electric suburban train traffic, it embraces a large area stretching to the coast, many factories involving siding traffic—which complicates electric passenger train working—and the operation of boat trains. A large part of the Division at present is involved in electrification of, and associated engineering works on, the Kent Coast main line, with consequent additional difficulty in operating heavily trafficked lines.

The establishment of a Line Traffic organisation for the Central and South Western Divisions will follow on at a later date and, in the meantime, the District Traffic Superintendents in the London (Central), London (Western), Southampton, and Exeter Districts will report to the Assistant General Manager (Traffic). The constitution of the South Western Division, the only one which is not unitary, has not yet been announced. Presumably something in the nature of a district organisation will have to be retained for the important industrial area around Southampton. Nor is it easy to see how traffic to Padstow, in Cornwall, for instance, can be managed from an office in London; so doubtless some district organisation will have to persist in Exeter. Other headquarters appointments, under the Assistant General Manager (Traffic) are Mr. A. Earle Edwards, now District Traffic Superintendent, Orpington, as Operating Officer; Mr. G. Wynne Davies, now Assistant Commercial Manager of the Region, as Commercial Officer; and Mr. G. A. Weeden, Acting Motive Power Superintendent of the Region, as Motive Power Officer. All these headquarter officers will have small staffs. The Assistant General Manager of the Region, Mr. D. McKenna, will continue as hitherto to act as Deputy to the General Manager, Mr. C. P. Hopkins, for all matters in his absence.

By and large, the new organisation seems to combine the better features of those in other Regions and notably the "line" organisation of the Eastern Region, to an adaptation of which the Southern Region lends itself so readily. There will be less disturbance than in some other Regions to the existing organisation—which is a considerable advantage. The Southern Region is by no means only a passenger-carrying concern; it originates some 7,000,000 tons of freight a year. It is freight traffic which at present needs the flexibility in rate quotation and in provision of services resulting from the decentralisation for which the Southern Region management has made provision. The way is now clear for even more vigorous efforts to win and retain traffic.

End of G.N.R. in Sight

WHEN the Royal assent was given to the Northern Ireland Transport Bill in Stormont at the end of last month, the way was opened to the integration of the Great Northern Railway with the Ulster Transport Authority in Northern Ireland. A successor to the Ulster Railway, one of the first railways in Ireland, the G.N.R. has given faithful service to the community since 1874, and the passing of this old-established undertaking will be mourned by many. The concern in transport affairs in the Province of Northern Ireland has been very evident of late in both Central and Local Government circles, but the public generally seems apathetic, and apparently not greatly interested in the future of the transport industry. Parallel legislation in the Republic provides for incorporation of G.N.R. lines in that country in *Coras Iompair Éireann*.

During the Second Reading of the Bill, more than 20 amendments were tabled in the Northern Ireland House of Commons, and several in the Senate. The determination of the Minister of Commerce, Lord Glentoran, to force the Bill through as it stood, was clear; not one of the amendments proposed in either House was accepted. The principal objectors were members of the Labour and Nationalist parties, who showed concern at what they considered arbitrary clauses. One principal objection was the tying down of the U.T.A. to balance its accounts within the next five financial years, and fear was expressed as to the fate of any sections of the railway which might remain at the end of that period; but no prophecy was forthcoming from the Government.

The greatest controversy was aroused by that part of the Bill which lays on the U.T.A. the obligation to propose the termination of uneconomic railway services continued operation of which would be inconsistent with the Authority's duty to balance its accounts. The way in which this clause was reported in the Press gave an unfortunate impression that, on October 1, when the Act comes into force, the services on the G.N.R. Portadown-Londonderry line would be terminated immediately. This caused an outcry, but the publicity given to this mistaken idea may well adversely affect the revenue of that section, and it was left to the Leader of the Senate to emphasise that the Bill did not specifically designate G.N.R. sections for closure. Their future will depend on whether or not they can pay their way. During the passage of the Bill no light was thrown on how the Belfast-Dublin main-line services would be affected; but it is reasonable to assume that the existing passenger services, or perhaps even better ones, between the capitals would be maintained, either by the appointment, by U.T.A. and C.I.E. for administrative and operating purposes, of a small committee, or some other mutual arrangement; it is possible that some time after October, trains in the livery of both undertakings may be seen working the services. The policy of substituting diesel for steam, pursued by both G.N.R. and U.T.A., is proving popular and attracting a certain amount of new passenger traffic, but it is offset by the increasing number of private motor-cars on the roads. An alarming feature is the extent of illegal carriage (against payment) of passengers in these cars, with consequent detrimental effects to both road and rail services, especially in and around Belfast.

Goods traffic also continues to be adversely affected by the activities of illegal hauliers, and there has been a reduction in the amount of livestock traffic carried, especially from the West through the ports of Belfast and Derry. Most of this important traffic was lost to public transport with the closing of the G.N.R. Enniskillen branch and the Sligo, Leitrim & Northern Counties Railway.

These factors, with rising costs, will determine the future extent of the rail service operation within the Province after October. There seems little doubt that future rail closures will take place, probably commencing with one of the Belfast-Londonderry lines. There is also the problem of staff redundancy, which is bound to be one of major dimensions. At the time of the closing of the Enniskillen and Armagh lines, many of the displaced staff

were absorbed on remaining sections of railway and some were seconded to the U.T.A. road services, but in the event of further rail closures with resultant diminishing openings for alternative employment, this could not possibly be repeated. The outlook, therefore, for the staff is bleak. The hard fact is that Northern Ireland is small in area, with its industries outside of Belfast too few and scattered; and therefore there is no great internal transport potential. The U.T.A. should seize the opportunity to evolve a bold scheme to co-ordinate rail and road traffic, using the best and most modern equipment available, if new and lost traffic is to be attracted. The Government must also view the Authority's problems with a more sympathetic understanding than it did those of the G.N.R.

Record Expenditure in South Africa

IN view of the rapid industrialisation and general economic development of the Union of South Africa, the Minister of Transport, Mr. B. J. Schoeman, has set the railways a formidable task in deciding on December 1961 as the date when the railways "should be able to meet all demands made upon them." In his budget, presented to Parliament recently, authority has been sought for loan and betterment expenditure of £78,900,000 to be spent before the end of the current financial year. Even after making full allowance for the fall in the purchasing power of the £, expenditure of this order is unprecedented in S.A.R. history, and is an indication of the administration's firm intention that transport should not lag behind or impede the country's progress.

The large sums voted and spent, almost £315,000,000, on expanding and modernising the system, are already having a noticeable effect on the railways' carrying capacity. Freight conveyed last year was 2,000,000 tons more than during the preceding year, which represents a rise in the average yearly increase for the past few years. The fact that the total tonnage of traffic continues to rise to new levels, despite the tendency towards slackening in the tempo of business and other activities in 1957-58, confirms the assessment the administration has made of the traffic potential.

The emphasis in Mr. Schoeman's proposals is on modernisation. Radio is being developed as an auxiliary to land lines, and radio links have been used to avoid land-line interference from electrified lines. Long-distance radio telephony has also been successfully introduced along part of the Natal main line. A departmental teleprinter network is also being developed, particularly with a view to more effective control of wagon movement. New wagon control systems have already succeeded in reducing standing time of vehicles by nearly 50 per cent. The number of wagons in service increased during the year by only 3,500, or less than 2½ per cent above the figure for 1956-57, but the number of wagon loadings improved by 250,000, an increase of more than 4 per cent over the previous year's total. Locomotive power was also increased during the year by nearly 3 per cent, and before December, 1961, motive power is planned to exceed the existing figure by a further 12 per cent. These developments indicate that the momentum of the expansion programme is increasing and, with the large electrification and diesel traction programmes in hand, show that every effort is being made to ensure that the railway system is adequate for the expanding economy of the country.

Despite the progress being made, there are some misgivings; the main problem appears to be concerned with the labour shortage. There was no appreciable change in the staff position as it existed at the end of the previous financial year, the principal difficulty being the lack of experienced staff. Intensified training at the railway schools serves to a certain extent to meet the deficiency, but an endeavour is being made to solve the wider issue of efficiency in the staff by campaigning for a sense of pride in the worker's own occupation and achievement.

The labour supply in the Union is limited, particularly as regards Europeans, and with other industries offering

higher wages and more attractive opportunities and steadily increasing their labour forces, the railways may well be faced with the necessity of diluting its European labour with an increase in the ratio of non-Europeans; a step which, according to Mr. Schoeman, the administration has found expensive in the past. One noticeable improvement in the staff position is the favourable effect which recently awarded allowances have had on recruitment.

Concurrently with this addition to the wage bill, the railway management has had to consider other rises in costs. As existing revenues were insufficient to cover these commitments, tariffs had to be increased. It is estimated that the additional revenue obtained as a result of these increases will amount to £7,296,000 and £2,067,000 a year from goods and coal traffic respectively.

Total revenue from all sources during 1958-59 has been estimated at £192,454,000, which is £11,710,000 more than last year's figure, and total expenditure at £187,658,000, exceeding last year's total by £13,750,000. This will yield a gross surplus of £4,796,000. Necessary net revenue appropriations will require an amount of £5,525,200, so that it is anticipated that the year will close with a net deficit of £729,200.

Winter Train Services, Southern Region

THE need for elimination of unremunerative services finds ample expression in the winter timetables of the Southern Region, due to come into operation on September 15. The cuts are to be mainly in the London suburban area, and chief among them is the entire closure of Cannon Street station between 10.15 a.m. and 3.30 p.m. and after 10.15 p.m. from Mondays to Fridays, from 3.15 p.m. onwards on Saturdays, and all day on Sundays. Certain services now using Cannon Street in future will start from and terminate at London Bridge, such as those to and from Bromley North. In addition, there are to be substantial reductions in the electric train services over the London suburban lines during the off-peak periods.

The general principle of these reductions is that lines now having trains at 15 min. intervals will have these intervals increased to 20 min.; those on which the present service is at 20 min. intervals will have a 30 min. service; and certain branches with half-hourly trains will have a service at hourly intervals only. A number of services will remain unaltered, however, such as those from Waterloo to Richmond, Staines, and beyond; Charing Cross to Orpington, Sevenoaks, and Tonbridge; Victoria and Sevenoaks (though the Holborn Viaduct-Sevenoaks service via Catford and Bromley South will be at 30 min. instead of 20 min. intervals); and Victoria and London Bridge (the South London line).

All the longer-distance even-interval electric services also remain practically unchanged, such as those from Waterloo to Windsor, Reading, Aldershot, Farnham, Alton, and Guildford—except that the Waterloo-Guildford service via Effingham Junction becomes half-hourly instead of at 20 min. intervals. The long-distance electric and diesel-electric services remain unimpaired; and this applies particularly to the hourly 95 min. service between Charing Cross, Tunbridge Wells, and Hastings, which is a great improvement on that of last winter. The late evening expresses from Charing Cross at 8.20, 9.20, 10.20, and 11.20 p.m., all introduced last summer, are being continued for the winter, as well as the up evening expresses from Hastings at 6.20, 7.20, 8.20 and 9.20 p.m. The inclusion of buffet cars in practically all the trains up to and including the 5.20 p.m. from Hastings and the 7.20 p.m. from Charing Cross is also a considerable advance on the refreshment facilities offered a year ago.

In the matter of refreshment and Pullman facilities in the Central Division of the Southern Region, a step was taken with the introduction of the summer timetable which is evidently to be permanent: withdrawal of these facilities from all trains starting their journeys after 8 p.m. The Pullman cars are not taken out of the train sets but are locked. The only exception is the last up working of the "Brighton Belle," at 8.25 p.m. from Brighton; a

reprieve also has been granted in the case of the 11 p.m. from Victoria to Brighton, in which buffet car facilities are now advertised. While these late evening Pullman and refreshment cars did little business on their up journeys, they will be missed by coastal residents who have been spending the evening in London, and who hitherto have been in the habit of taking supper or refreshments in the train on the way home.

On the Waterloo-Portsmouth line the new train introduced in the summer from Waterloo at 5.35 p.m. to Guildford and most stations beyond is continued for the winter; another train retained for the winter is the 9.22 a.m. from Bournemouth West and 9.32 a.m. from Bournemouth Central to Brockenhurst, Southampton and Waterloo (12.49 p.m.), but the 7.40 p.m. 2-hr. express from Bournemouth Central to Waterloo is withdrawn. On the West of England main line the closing of Plymouth Friary station means that all Southern Region trains will now terminate and start from North Road.

Creating Traffic with Railcars

ONE may now ask what success has attended introduction of diesel railcars on British Railways since this began on an extensive scale in 1954—though the successful pioneer work of the Great Western Railway in this field started before the last war, and continued by its successor, the Western Region, must be borne in mind. The total number of diesel multiple-unit cars in all Regions now exceeds 2,000; a total of 4,600, all of which are expected to be in service by the end of 1961, is being provided under the modernisation plan. Introduction of all services has been accompanied by much well-designed Press and poster publicity in the areas concerned, mostly at some distance from London, and by intelligent and imaginative excursion and cheap fare facilities.

Many of the services, such as those between Leeds and Bradford and Harrogate in the North Eastern and in Hampshire in the Southern Regions, have attracted a great deal of remunerative traffic. Operating costs have been cut drastically, as was to be expected. The fact remains, however, that some diesels, mostly on country branches, are carrying passenger loads which do not cover operating expenses, even although they may greatly exceed those of the steam trains which the diesels replace. One reason for closing the Midland & Great Northern Line is the unlikelihood of diesel services proving remunerative, because the reduction in operating costs and improvements in receipts from railcars on lines more likely than the M.G.N. to engender traffic, have not sufficed to bring services into financial equilibrium. By all accounts there are tracts of country which offer no traffic potential for any kind of public passenger transport. Amongst the reasons are the increase in private transport, including power-assisted bicycles, in rural areas; sparsity of population; and, it is often stated, television, which keeps people at home.

In view of the urgent necessity to cut costs by eliminating unremunerative services, more than one Region is understood to be considering reductions in its diesel services on country branch lines, and, possibly, closure of sections whose existence has been prolonged by what has since proved an unsuccessful experiment, though no doubt the value of these lines as feeders is being duly assessed. That would certainly be unpopular with some of the public, and disappointing to many who regarded fast, frequent, and comfortable railcar services—as indeed are those now provided—as the solution of the branch-line passenger problem. Occasional failure in bold experiment does not discourage any alert and enterprising organisation. At all events, it cannot be denied that vigorous efforts to capture traffic have been made. More encouraging is the existence of a great many other lines in Britain where diesels can create profitable traffic. They await delivery of railcars, of which a proportion—it might well be higher—and the engines for the cars built in British Railways works, are being supplied by outside builders particularly skilled in railcar design techniques.

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of Correspondents)

Smoking in Trains

July 30

SIR,—We are grateful to Mr. Will Lynch for his letter published in your June 27 issue. It is a scandal that the flagrant flouting of the regulation making it illegal to smoke in non-smoking compartments is allowed to continue so brazenly.

For the non-smoking section of the public to be thus treated would be bad enough in any case. But now that it is established that smoking is not only a menace to the health and life of the smoker but also to the non-smoker whom he forces to inhale his smoke, it is an outrage that such conditions should be allowed to persist.

Yours faithfully,

H. V. LITTLE
Secretary

National Society of Non-smokers,
138, East Dulwich Grove, S.E.22.

Accompanied Baggage

August 1

SIR,—The editorial note in your August 1 issue revives the wonder long since felt as to why the excellent London, Brighton & South Coast Railway accompanied-luggage system was discontinued. This system was simplicity itself. The passenger's luggage to be consigned to the brake van was labelled with a coloured label including a large serial number, the same number for each package, and an additional label also with that number was handed to the passenger. On arrival at the station of destination, the passenger had only to hand his label to a porter and tell him the number of packages; the porter could see the large numerals at a glance and was easily able to distinguish the particular passenger's luggage, with much saving of time and trouble to all concerned.

Why cannot this facility be reintroduced? Surely it would reduce the overcrowding of compartments and corridors with luggage. Luggage-in-advance is all very well for heavy trunks; but it is not cheap, and one has to take smaller articles such as suitcases for immediate use before and after the journey while the trunks are in transit. I never heard the L.B.S.C.R. system adversely criticised when in use.

Yours faithfully,

F. S. BOND

Southborough

Motive Power Policy

August 1

SIR,—Your correspondent, Mr. J. B. Latham, who in his letter in your July 25 issue complains about the ordering of a large number of diesel units at a time of Middle East crisis and when coal is being over-produced in Britain, possibly feels that such matters are decided by logic and common sense. A perusal of your August 1 issue should at least make him wonder. The most outstanding point is the description of the quite remarkable performance given by a 78½-ton diesel-hydraulic locomotive in some of the most arduous conditions to be met with on British main lines. In the same issue you record the order placed by the British Transport Commission for no fewer than 124 diesel-electric units of almost the same weight (and cost?) but with less than half the power of the diesel-hydraulic locomotives.

On another page you question whether an AIA-AIA diesel-electric locomotive weighing 102 tons—not much less than the 3,300-h.p. Deltic (106 tons)—can be considered satisfactory for an output of 1,250 h.p.

One might well wonder whether these are the machines

which, in the words of the Minister of Transport & Civil Aviation, "should greatly improve railway revenue earning power"—this when it is fairly clear that the diesel locomotive *per se* is unlikely to attract a single additional passenger or ton of freight, or to make any serious improvement in travel time or costs.

From the same source we learn that the diesel is only an intermediate phase before electrification from atomic power, which may possibly account for the dreadful slowness with which electrification is proceeding. But rather than wait all that time for the atom, would it not be possible to point out to somebody that the small coal which the National Coal Board is reputedly dumping into disused quarries could be used just as well? If this were realised, possibly there could be some sense of urgency about electrification and those of us now in middle age might have a chance of seeing really modern work before we pass on.

Yours faithfully,

L. IRVINE-BROWN

West Shore, Hythe, Southampton.

[The much-improved running already achieved on British Railways with diesel-electric locomotives is common knowledge, and the improved timings being planned for diesel-hauled passenger and goods trains are based on the capabilities of diesels. Far from "dreadful slowness," electrification is making good progress: both in the Southern Region extension to its 660-V. third-rail system and in the conversions at 50 cycles in other Regions.—ED., R.G.]

Closure or Modernisation

August 6

SIR,—There are lessons to be learnt from the impending closure of two lines in Switzerland, a country where railways are well protected from competition.

The Appenzellerbahn, a metre-gauge electric line with up-to-date rolling-stock, incurs a loss because people do not want to travel in sufficient numbers between the places it serves, and examination shows that costly modernisation will not succeed unless actual traffic or potential traffic exists.

On the other hand, the never very successful Brienzer-Rothorn Bahn has failed because of the cost, lack of passenger appeal, and slowness of steam operation on this purely tourist rack railway. It doubtless could make a working profit if electrified, or equipped with diesel rack railcars as was the Monte Generoso rack line near Lugano; but it cannot afford such new equipment, and so is to give way to a cheap but less attractive and less comfortable *luftseilbahn* (*téléphérique*). Here is a line which runs at a loss, yet has a real potential traffic, and would justify modernisation if any far-sighted person or company invested the necessary money.

One wonders how far the decisions made between closure and modernisation of lines in this country depend on assessments of traffic potential rather than on whether the lines as they now exist make a marginal profit or a small loss.

Yours faithfully,

JOHN RODGERS

132, Worrin Road, Shenfield, Essex

[The Appenzellerbahn has no counterpart in Britain, and that of the Brienzer-Rothorn Bahn is the steam-worked Snowdon Mountain Railway, unique in the British Isles. Before a line of British Railways is closed, much thought is given to the possibility of modernisation, as with diesel railcars or railbuses in the case of passenger traffic; the value of the line as a feeder also is considered. Traffic potentials are certainly assessed, and with great care.—ED., R.G.]

THE SCRAP HEAP

Company-Owned Cutlery

At dinner on a recent journey on the down "Hook Continental" between London and Harwich, seven items of cutlery were placed before us. One bore the Great Central emblem, one the Great Eastern, one "Midland Cars," one "Great Northern Railway D.C.," two were L.N.E.R., and one L.M.S.

No Recruiting Problem for Railways

Twenty Pounds will be immediately given to any gentleman who will procure for the advertiser, aged 30, a situation on a railway, as guard, conductor, or other, wages not less than 20s. a week. The most inviolable secrecy may be relied on. Address, B.B., Post-Office, Kensington.—From "The Railway Times" of October 28, 1848.

Preserving U.S.A. Railway Relics

The open-air railway museum at Barretts, Missouri, is claimed to be the largest collection of historical railway material in the U.S.A. Exhibits include an early Pullman car "bearing," according to one account, "the scars of Indian arrows"; a (? Baltimore & Ohio) "camelback" 4-6-0, with an elongated, glazed cab, like a signal-box, on top of the boiler; a Delaware, Lackawanna & Western 4-4-0 with two cabs—one half way up the boiler and one at the rear for the fireman; the more familiar type of early wood-burning 4-4-0 with "diamond smoke-stack"; and the "rapid transit" electric car seen on the right of the accompanying illustration. The public is encouraged to help maintain and improve the collection by monetary contributions

and by personal work in laying track to expand the yard, as the illustration shows. The museum was established at the end of the last war.

Scotch Missed?

Whisky galore—2,028 bottles of it in 169 cases—was missed yesterday from the Southern Region goods depot at Bermondsey, London. Detectives began a search. But last night nobody could say whether the £3,800 consignment was stolen or not. Said a railway spokesman: "It came here by trailer on Wednesday night. Today the trailer was empty on the other side of the depot. There is a possibility that the cases—all well labelled—were moved off by mistake. They could be on a truck somewhere." So goods trains are being checked.—From the "Daily Express."

Vital Statistics

If you want to send an elephant by rail, you must give its vital statistics, more particularly its height and weight. For the . . . outside in elephants, a special elephant truck has to be used, but for a baby or half-grown animal no such special arrangements have to be made. It was because of the lack of information that an elephant which was expected to arrive at Durban by ship was delayed at the docks and could not be railed immediately. The firm which ordered the truck for the expected animal did not say how big it was; officials thought that only small elephants were imported for circuses and since the only elephant truck available was at Pietersburg, it was decided to wait for the arrival of the animal

before ordering the truck. On arrival it was found to be too big for the ordinary truck and an elephant truck was hastily despatched from Pietersburg.—From the "South African Railway News."

C.P.R. Loco Water for Manitoba?

Not only were the drought conditions in Manitoba last Spring a source of anxiety to farmers, but they also made matters extremely awkward for householders. Soft water for washing purposes is being bought in many places, as only a fortunate few have any left over from the autumn rains. A Manitoba correspondent of *Country Life* writes: "The only reliable source is at the 90-ft. level, and the shallow wells give out quickly in dry weather. However, it is hoped that in the not-too-distant future arrangements will be made to take over the Canadian Pacific Railway's pumping station and water tank, as their steam engines are being replaced by diesel locomotives."

Track Philosophy

Into a hazy, blue infinity
The gleaming rails go tapering from sight,
Suggestive of some strange affinity
With man's brief tale of morning, noon
and night.

If we have virtues there is no excuse
For coddling them or taking them on trust;
Even the toughened rails need constant use
To keep them shiny-surfaced against rust.

And if, at times, we feel a trifle frail,
When heavier loads than usual come our way,
We, too, must be resilient, like the rail,
To bear the heat and burden of the day.

What if the road before us seems obscure?
What if we cannot see around the bend?
There will be signals, vigilant, secure,
To see us safely through to journey's end.

At times we may experience rough riding
Or feel the need to make another start;
There will be, here and there, a friendly siding,
Wherein to rest awhile and take fresh heart.

We shall survive the stresses and the strains
And nothing, surely, need make us afraid,
If we set out to travel, like our trains,
On track well ballasted and truly laid.

A. B.



Members of the public laying track to expand the railway museum at Barretts, Missouri. Note "rapid transit" electric car with cowcatcher, and collecting box for contributions

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

INDIA

Khandwa-Hingoli Link

A further section of 15 miles from Takal to Amulla, on the metre gauge link of the Central Railway between Khandwa and Hingoli was opened recently for all traffic. When completed, the line will connect the northern and southern metre-gauge systems, affording through running between the extreme North-East, Rajasthan, and Central and South India.

Signalling and Interlocking

The following is a synopsis of improvements in signalling and interlocking now proposed:

(i) *Automatic block signalling with colour light:*

(a) Sini-Rajkarswan, Chandil-Kandra and Kandra-Kharagpur sections of the South Eastern Railway;

(b) Kurla-Thana-Kalyan section on the Central Railway in continuation of the existing system from Bombay Victoria Terminus to Kurla; also Jalgaon-Bhusaval (Central Railway);

(c) Howrah-Serampore-Sheoraphuli (Eastern); Dehri-on-Sone—Sonenagar (Eastern);

(d) Ghaziabad-Delhi; Benares-Moghalsarai (Northern);

(e) Andheri-Virar (Western), so extending the existing system between Bombay and Andheri.

(ii) *C.T.C.:* to be installed as an experimental measure on one B.G. and one M.G. single line section to verify the extent of actual increase in line capacity.

(iii) *Power signalling:* Washermenpet (Southern); Bezwada - Secunderbad (Central); Ahmedabad (Western); Allahabad, Lucknow, Cawnpore (Northern); Moghalsarai, Sealdah (Eastern); and Kharagpur (South Eastern).

(iv) *Panel interlocking with tokenless block working on single line sections:* to be installed on one M.G. (between Kalol and Mehsana on the Western),

and one B.G. (between Ratlam and Kotah on the Western Railway) single line section as an experimental measure.

(v) *Route relay interlocking:* Delhi (Northern); Howrah (Eastern); Kurla (Central); and Churchgate (Western).

(vi) *Intermediate block signalling:* Alahabad and Chheoki (Northern Railway).

WESTERN AUSTRALIA

Frozen Food by Rail

Six refrigerated containers are now being constructed in Victoria for the W.A.G.R. They will be equipped with adjustable temperature controls which will enable them to be used for various types of perishable traffic. Each unit will have a capacity of 450 cu. ft.

They will be specially suitable for snap-frozen foods and frozen meat for export. They can be loaded inside the freezing works and then conveyed to wagons for onward despatch, so greatly reducing transfer charges and times.

The containers will be operated between Albany and the lower Great Southern Railway and between the South West and Perth.

Besides this equipment, six general-purpose containers are being obtained for use in road and rail co-ordinated services such as between rail facilities at Bunbury and the Railway Road Service trucks operating to Flinders Bay.

VICTORIA

"Piggy-Back" Transport

As reported in our issue of July 25, a trial was made recently in Melbourne of "Piggy-Back" transport. The accompanying illustration shows a heavily laden road semi-trailer being lowered on to a specially adapted rail wagon, and the cradle support for securing the semi-trailer in the wagon.



Fully loaded semi-trailer in position in rail wagon after lifted by overhead gantry crane from road vehicle

The inside dimensions of the wagon are 69 ft. 4½ in. x 8 ft. 3½ in., and there is accommodation for two semi-trailers with a chassis and load weight of up to 16 ton each. It is a South Australian Railways "O.A." wagon, normally used for the transport of motorcar bodies from Adelaide to Melbourne, specially adapted at the Victorian Railways Newport Workshops.

Furniture by Rail

Household furniture to or from the country or another State can be sent by rail far cheaper than by road as was recently demonstrated by a resident of Bendigo, transferred to Sydney. Considering some road rates excessive, he decided on rail transport. The furniture left Bendigo on a Wednesday and was in his new home in Sydney before noon on the following Tuesday. It was in perfect condition, with beds erected and all furniture placed in position by local carriers.

The cost by rail, including all carriers' charges, was £52 8s.; by road, the rates quotes were £132, £106, and £87 10s.

TURKEY

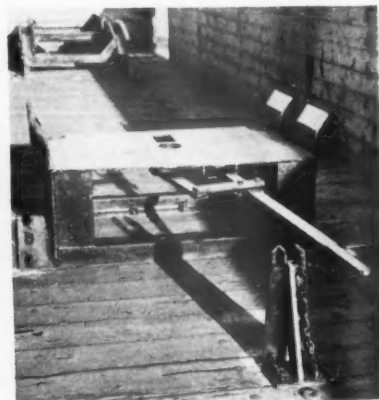
Weighbridges from Hungary

The State Railways are obtaining 625 weighbridges from the Hungarian trading Company, Nikex. Delivery, which is to cover estimated needs for 10 years, is to start in three months. Ninety of the bridges weigh 95 tons, and the remainder 100 tons.

CANADA

Interchangeable Containers

A new freight-carrying system based on cargo containers, adaptable for road, rail, and sea transport and interchangeable with a minimum of labour and time, was demonstrated recently before



Cradle support in rail wagon for semi-trailer

a group of carrier officials from Canadian National Railways and Canadian Pacific Railway. New York Central Railroad has already placed several units in operation.

The system is based on containers of about 40 ft. long. Wheels and running gear are attached when they are to travel by road, hauled by road tractor, and removed when carried on rail wagons.

To transfer from road to rail the tractor backs up against a bogie bolster wagon and the container is scooped off on to a hydraulic turntable on the wagon. It goes on crosswise and is then moved around parallel to the wagon and locked in place. The operation is reversed for transferring the container to a tractor from a rail wagon. For transfer from ships, cranes are used.

The containers are built by the Fruehauf Company of Canada for hauling all types of freight including liquids, and the specially designed wagons are built by the Canadian Car Company.

ITALY

Approaches to Mediterranean

The Italian State Railways recently approved the acquisition of 11 "E-636" electric locomotives for working on the lines between the Swiss frontier and Alessandria, north of Genoa, in which region electrification of several sections of line is in hand. Further improvements in this area include doubling of the Gallarate-Arona section (15½ miles) of the Milan-Domodossola main line, and the building of a new tunnel near Vergiate on this main line, 34 miles

north of Milan. Other works on the Milan-Domodossola line are renewal of the Strona viaduct, and the rehabilitation of various bridges.

The financing of this development work and of the conversions has been made possible by the credit of 200 million Swiss francs granted by the Swiss Federal Railways to the Italian State Railways early in 1957.

SWITZERLAND

Centenary of Rorschach-Chur Line

Recent celebrations marked the centenary of the Rorschach-Coire line, opened to traffic on July 1, 1858. The line was intended as an approach to the so-called "Eastern Alps Line" (Ostalpenbahn) which, planned to extend south of Chur, was to have provided a main line connection with Milan. This scheme, however, was later abandoned in favour of the Gotthard project, and Chur has remained to this day the south-easternmost railhead of the Swiss Federal Railways.

FRANCE

Bridge Lifted to Increase Clearance

An overline road bridge, the Pont de la Folie, near Paris, was 2 ft. 2 in. too low at its lowest point to give clearance to catenaries on lines being electrified at 25 kV., 50 cycles, and lifting was necessary. The bridge spanned the section of Grande Ceinture line, now being electrified, and also the Paris-Strasbourg main line of the Eastern

Region, to be electrified later, 18 tracks in all on the skew at an angle of 74 deg. The total length was 370 ft. and the width 33 ft. The spans varied in length; the longest was a metal one of 197 ft., divided into three sections. Lifting was carried out successively on the different spans and sections with the aid of eight 100-tonne and 50 8-tonne jacks between August, 1957, and April, 1958, the amount of lift varying from 17 in. to 3 ft. 1 in. During this period road traffic was interrupted, but there was no delay to rail traffic.

Floorless Flat Wagon

The S.N.C.F. has designed a special type of flat wagon without floor for transport of 40-ft. lengths of pipeline. The undercarriage, of the type used for covered wagons, is mounted on two eight-wheel bogies; to give additional length, however, a special 5-ft. 7-in.-steel section is welded into the centre, and 85-100 ton standard buffers are fitted. Steel strengthening plates are fixed at each end and two stanchions attached at each side at the point of the bogie axis. Each wagon can carry 24 pipes.

NORWAY

New Tunnel

The proposed tunnel through the Ulrikken mountains, east of Bergen, will avoid the long detour and cut transits between Oslo and Bergen. The project is to be carried out by tender on behalf of the State Railways, and is expected to take about four years. The tunnel will be some 7½ miles long.

Publications Received

List of Films, Film Strips and Wall Charts.—The general arrangement of the list published by the Aluminium Development Association, of 33, Grosvenor Street, London, W.1, in which nearly 60 sound films (16 mm.) available on loan are classified under production, working operations, joining and applications, has been preserved in this edition. Particulars are also given of 35-mm. film strips. A service provided by the A.D.A. Education Department is the supply of wall charts with teachers' notes on aluminium—production; aluminium alloys—preparation and properties; aluminium in everyday use; and production of castings.

The Caffin Story.—Published to mark the 50th anniversary of Caffin & Co. Ltd., 25, Craven Street, Strand, London, W.C.2. This book of 28 pages tells the story of the fortunes of the company. At the outset the firm's main business was concerned with railway contracting, and the book illustrates and describes some examples of its projects particularly for the Great Western Railway. Although the railways still provide a quite large amount of work, the

firm is now also engaged in civil engineering and building, both in this country and overseas and these wider activities are also mentioned in the publication.

Welding Inspection Services.—A brochure describes the welding inspection services offered by Metal & Pipeline Endurance Limited. The company offers such facilities with visual; gamma- and X-ray; ultrasonic and other non-destructive tests. Copies may be obtained from the firm at Artillery Mansions, Victoria Street, London, S.W.1.

This is T.I. Today, 1958.—The 1958 issue of this small booklet lists the home subsidiary and associate companies of Tube Investments Limited, The Adelphi, London, W.C.2. It also gives brief mention of the main products of each company.

Beclawat Products.—A catalogue published by Beckett, Laycock & Watkinson Limited, Acton Lane, London, N.W.10, describes the range of products manufactured by the company for the railway section of the transport industry. Index sheets have been incorporated to facilitate reference and

arrangements have been made to have all future sheets open punched so that they can be easily added into their appropriate section of the catalogue. Similar catalogues dealing with products for road and marine transport applications are also available. Copies of the publications may be obtained on application to the company.

Phenix Magnetic Lifting.—A 16-page catalogue has been issued by W. E. Burnand & Son Ltd., Duo Works, 66-106, Shoreham Street, Sheffield, 1, which describes the range of electro-lifting magnets manufactured by the company. The construction, specification and control systems of the electromagnets are given, with some hints to ensure satisfactory operational performance.

A.C.E.C.—An illustrated review of the range of electrical, electronic and nuclear equipment manufactured by Ateliers de Constructions Electriques de Charleroi, of Charleroi, Belgium, has been produced by that company. With text in French and English, the booklet of some 96 pages includes sections dealing with railway material, such as signalling and electric traction equipment.

Seventeenth International Railway Congress**Economic Working of Light Railways***Methods of reducing operating costs*

QUESTION 10 on the agenda of the International Railway Congress Association at its Madrid session next month is concerned with the means to be adopted to reduce the operating costs of light railways. Mr. S. L. Kumar, Director, Research, Indian Railway Board, Ministry of Railways, Lucknow, has compiled the report on practice in English-speaking countries and on certain railways overseas which tend to follow English practice.

In drawing up the questionnaire the term light railway was defined as a railway "which may be distinguished from a normal main-line railway by its lower density, lighter trains, and by the smaller axle-loads running on it. Such a railway may have a certain importance from the economic or political point of view, but it is not dependent upon the profile, the gauge, or the frequency of the train service."

The East African, New Zealand Government, Malayan, Iraqi State, and Burma Railways replied that they worked no light railways. Both the Japanese National and U.S.S.R. Railways stated that they made no clear demarcation between the normal lines and the so-called light railways. British Railways also do not operate or propose to operate any light railways in the future. The Association of American Railroads reported that in the U.S.A., in recent years, there has been a diminution of light or secondary railways, so that the question of development of light railways was not applicable. Of the 34 railway administrations approached on the question only five returned fully detailed replies.

The light railways in some countries are sometimes designated as secondary lines and in others, such as Argentina, as "improving railways," meaning developmental lines. Some countries classify their narrow-gauge lines in general as light railways.

Light railways mainly serve agricultural areas and usually traverse sparsely populated parts of a country. In the majority of cases they are constructed with the aid of capital provided either by the State or private companies.

Except for the Swedish State Railways, none of the administrations questioned have constructed a light railway during the last 20 years and no development is envisaged. Some 30 miles of light railway is at present under construction by the Swedish State Railways to connect industrial plants along the coast. This line is being laid with old 87-lb. rails varying in length between 62 and 92 ft. and laid on wooden sleepers 2,080 to 2,240 a mile, and with gravel ballast. The rails are secured to the sleepers by spikes. Minimum radius of curves is about 30 ch., and

the maximum gradient 1 in 60. The Swedish State Railways report considerable simplification in the routine working of the whole railway network, including the light railways. Diesel traction has been introduced to a great extent and abandonment or reduction of services on sections running at a loss has been intensified. Where rail traffic has been abandoned replacement services have generally been arranged for passengers and small consignments.

The South African Railways state that where traffic does not justify a regular service, passenger traffic is moved by road transport, and goods traffic by trains as and when required.

In most cases no simplification in the operation of light railways has been possible because operating procedures are common to both light and main lines. The Swedish State Railways have closed many stations and limited the time of opening of ticket offices of others. The demand for safety and satisfactory operation of trains, however, has made it impossible to reduce staff or to carry out other economy measures to an extent that would make the operation of light railways profitable. Other administrations carried out similar steps to achieve the highest possible economy in the operation of light railways. Replies received indicate that the carrying capacity of light railways generally exceeds the traffic potential. Where the capacity is deficient as on some sections of the South African Railways, the narrow-gauge lines are being converted to a larger gauge.

After Closure

As a rule, where the light railways have been abandoned, the carriage of passengers and goods has been taken over by road transport. The replacement services are usually run by public companies and in the case of the Swedish State Railways, the railway has a share in the running of the road service. Such services have been able to cope adequately with all traffic offered and have generally given satisfactory service. The Swedish State Railways have reported that, because of the closing of some 430 miles of lines during the last few years, there has been a considerable net gain accruing to the railways. Generally the abandonment of light railways has not caused the public any inconvenience.

Locomotives

Steam locomotives with light axle loads weighing between 4 to 9 tons on narrow gauges, 2 ft. or 2 ft. 6 in., and 11 to 16 tons on broader gauges, 4 ft. 8½ in. or 5 ft. 6 in., are generally used on light railways. Quite often

they have previously been in use on the main lines and, therefore, many are quite old. A few diesel locomotives have been introduced and also railcars on some sections.

None of the administrations has reported any important alterations during the last 10 years to installations and rolling stock. The only exception is perhaps the Ceylon Government Railway, which is strengthening track structures to enable heavier engines to run at faster speeds. There is no report of any radical change in the design of wagons and coaching stock.

Financial Position

The financial position of the light railways is, in general, far from satisfactory. Viewed purely as a transport scheme, their existence cannot be justified though they are essential to the economic development of the region they serve. The railways have taken all practical steps to reduce the working expenses and thus cut down their losses. In many cases there are no possibilities of operational improvements unless radical alterations are made to the mode of traction, and railcars and improved type of stock are provided. As this investment is not considered justified, the deficits in working have been reduced by abandoning the lines with low density of traffic either wholly or in part; by closing, during a part of the day or in entirety, certain stations, and by using light railcars for passenger traffic. The raising of tariffs to increase the receipts is generally not practicable because road services offer keen competition and such a step evokes strong public resentment.

Conversion to diesel traction is in its infancy on the main lines of many reporting railways but it is unlikely that any of the light railways will be completely converted in the near future in spite of the fact that some of the administrations believe that the operating expenses can be drastically reduced by complete dieselisation. This has been proved by the experience gained on the Swedish State Railways where the earning capacity of their light railways has improved since they modified operating methods and partially dieselised goods services. An approximate annual saving of about £1,000,000 is estimated if on certain light railway sections steam traction is entirely replaced by diesel traction at an initial outlay of about £7,000,000.

Reports received indicate that in many cases road services exist almost parallel to the existing light railways and offer keen competition. The South African Railways themselves are the largest road transport operators in the country but

(Continued on page 188)

Concrete Cover Protection on Western Uganda Line, E.A.R. & H.

To prevent rock slips on Western Rift escarpment, a 400-ft. concrete covered-way has been built



Arch ring unit being lifted from wagon by gantry running on abutments

likely to be difficult and dangerous if, at the same time, the line was to be kept open to traffic. An alternative solution was therefore adopted to provide a cover over the line for a length of about 400 ft., preventing any further falls from coming down on to the track.

Construction of Covered Way

Mass concrete abutment walls were first built, using precast concrete blocks as face shuttering; due to the limited working space available at site, the concrete for these walls was mixed in and placed from an engineering train taken into the section from the nearby Dura River station. The roof itself is formed of pre-cast reinforced concrete arch rings manufactured at the E.A.R.&H. pre-cast concrete yard at Port Bell.

Positioning Concrete Units

Each unit weighs approximately 5 tons and is brought by rail to the site on railway wagons. Lift holes are so cast in the units that they are at the centre of gravity of the units in both the horizontal and vertical planes. At site the units are lifted by a gantry travelling on top of the completed abutments and are swung about the centre of gravity from the horizontal to the vertical position and then placed on top of the abutments. The joints between the units are filled with bitumen and covered with strips of

SINCE the Western Uganda section of the East African Railways & Harbours was opened in November, 1956, heavy rock falls along the Western Rift escarpment, some 190 miles from Kampala, have been the cause of minor derailments and considerable delays to traffic, particularly during the rainy seasons.

The railway crosses the Dura River about half way down the escarpment, overlooking Lake George, and to cross this river gorge at a suitable point it was necessary to make a deep cutting through the sides of the gorge. This area lies within the heavily faulted region of the edges of the Western Rift Valley and is subject to frequent earth tremors.

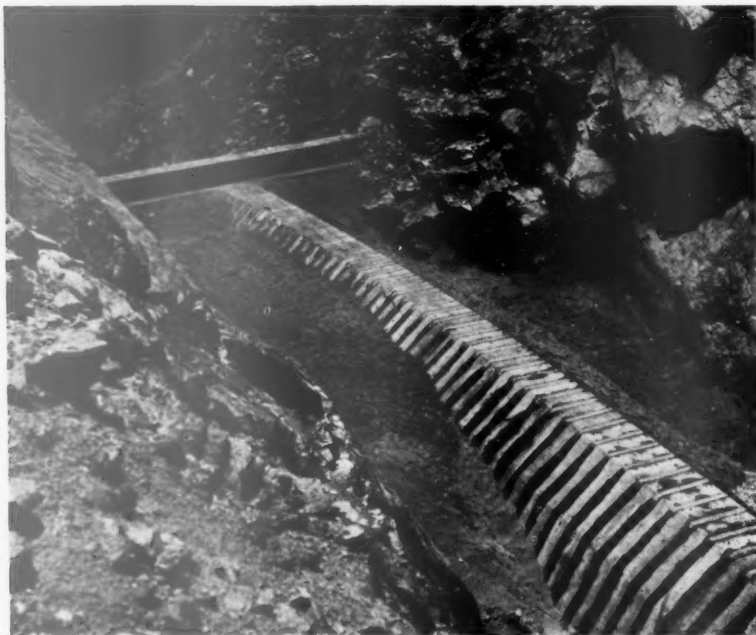
Considerable work had to be carried out during the construction of the line in sloping back the rock excavation to form reasonably-stable slopes as the rock proved to be very shattered.

Rock Falls

Since the line has been opened, however, several heavy rock falls have again occurred, causing damage and delay to trains. The possibility of further cutting back of the slopes of the cutting was considered, but was thought



General view of work in progress, with completed roof in foreground, gantry placing arch unit, and others still on wagons



bitumastic felt. The whole of the arch is then covered to a depth of some 5 ft. with earth so as to form a cushion against rock falls of the future. The finished cost of this work will be about £22,000.

Portal and part of completed arch roof with haunches partly filled and awaiting top cover cushion

Economic Working of Light Railways

(Concluded from page 186)

their road services act as feeders or supplement the carrying capacity of the railway where it is in deficit. In Sweden the railways run their own buses and lorries either directly or through private companies owned by them. Even so, large numbers of private cars offer very serious competition in carrying of passenger traffic. It has been estimated that in India and Ceylon the light railways carry about 50 per cent of the total traffic offering, the remainder being carried by the road services.

The railways in almost all countries, barring small lengths privately owned, have been nationalised. The road transport system with some exceptions is owned by private agencies. At present, in India the freight services are mostly privately owned and privately operated, though the passenger services have been nationalised by some states who either run them departmentally or through road transport corporations. In some of the states the Railways are also beginning to have a share in these corporations. On the Victorian Railways and in Ceylon, road services are owned entirely by private operators and the railway department is not, in any way, associated with their management.

The road transport system has the initial advantage of not having to invest any capital on construction or maintenance of roads, though it pays road taxes on the vehicles and taxes on the fuel. In South Africa the road services owned by the railways enjoy some concessions and statutory privileges.

As a result of not being governed by any definite transport obligations, road transport undertakings carry the high-

rated, regular, and well balanced traffic.

The importance and usefulness of light railways is generally on the decline and their financial position far from satisfactory. This has been brought about by the advent of the modern road transport system which is gradually supplanting them. Here and there efforts are being made to revitalise them and strengthen their economy and thereby obtain marginal benefits from them as long as it is possible.

CLOSURE OF GOODS BRANCHES IN N.E. REGION.—British Railways, North Eastern Region, announces that, because of the financial loss being incurred, the section between Sowerby Bridge and Ripponden Freight Depot will be closed as from September 1. Closure has been approved by the Transport Users' Consultative Committee for the Yorkshire Area and also by the Central Transport Consultative Committee. Full wagonload traffic for Ripponden will be dealt with at Sowerby Bridge and be conveyed thence by British Railways road motor services; small freight consignments for Ripponden are already dealt with at Halifax and this arrangement will continue. For the same reason, it is necessary also to withdraw, from the same date, the goods train services between Hexham (exclusive) and Reedsouth (exclusive), and Bellingham (exclusive) and Riccarton Junction (exclusive). At the same time, Humshaugh, Chollerton, Barrasford, Wark, Falstone and Kielder Forest stations, and the public delivery sidings at Tasset, Plashetts, and Saughtree will be closed. This closure also has been approved by the Transport Users' Consultative Committees concerned and by the Central Transport Consultative Committee. British Railways' road motor services operating from Hexham will serve points between Hexham and Reedsouth, whilst similar road services operating from

Bellingham will serve places between Bellingham and Riccarton Junction; Bellingham will be served by rail from Morpeth via the Morpeth-Reedsouth branch.

RESTRICTION TO FIVE MILE HOUSE SERVICES.—From September 15, Five Mile House station, on the Boston-Lincoln line of the Eastern Region, will be closed to regular passenger traffic. Trains used by anglers on Saturdays and Sundays during the fishing season (June 16 to March 15) will continue to call. From the same date the goods and parcels facilities will be withdrawn. On Mondays to Fridays passengers will be catered for at Lincoln Central station and by the buses operating in the area. Parcels traffic will be concentrated at Lincoln Central station, whence C. & D. services operate. Freight traffic in fullwagon loads will be dealt with at Lincoln Holmes Yard or Bardney, and C. & D. services will continue to operate from Lincoln Holmes Yard.

BRITISH ROAD SERVICES STAFF SUGGESTION SCHEME.—Since the British Road Services staff suggestion scheme was introduced in February, 1958, some 400 suggestions already have been submitted. More than £300 has already been paid in awards in respect of 62 suggestions, and about 100 are currently under investigation. The highest award so far has been £25, paid to Mr. P. Hargin, a foreman mechanic at Glasgow Parcels Branch; he devised a cradle trolley to facilitate servicing of three-wheel Scammell Scarab units, and the trolley is already being used successfully at Glasgow Parcels Branch. Mr. John Sharp, a ledger clerk at London District Accounts, received £20 for a simple idea, since adopted, concerning current account advices. Other awards of from £2 2s. upwards have gone to staff in many parts of Great Britain. The scheme is a continuing one and information on awards is to be announced from time to time.

Automatic Couplings on Goods Wagons

High cost has delayed introduction on European railways

(By a correspondent)

PROGRESS in the equipping of freight rolling stock with an automatic centre buffer coupling has been slower in Europe than in other parts of the world. These couplings are almost universal in North America, and are also prevalent on most railways in Central and South America. Most systems in South, East, and Central Africa have changed or are changing to the automatic centre coupling, as are those in Australia and most Asian countries except India. The principle has also been adopted in the U.S.S.R. and in China.

It may be asked what is the chief factor which has led to the introduction of an automatic coupling in these countries and why the change has been largely resisted by railways in Europe. The most important factor encouraging its use has been safety of employees and pressure from labour organisations. The Japanese Government Railways tried to justify the changeover to an automatic coupling in 1925 on economic grounds, but certain special disadvantages existed in Japan with the pre-1925 link-and-screw coupling, and the same considerations do not apply elsewhere. In Europe, however, although the principle of the automatic centre coupling for freight stock has been strongly advocated by organised labour, in particular through representations of the International Labour Office, economic considerations have so far proved too strong to permit widespread use.

Varying Practices in Australia

Immediately after the 1914-18 war, there was strong pressure by organised labour in Australia for the introduction of an automatic centre coupling, and this led to the setting up of a Royal Commission on Automatic Couplings in the late 1920's. Since then the automatic centre-buffer coupling has been accepted as standard by most of the Australian railways for locomotives, carriages, and wagons. Long-term plans provided for the conversion of the entire stock, which has gone on steadily since that time. Conversion, however, is not yet complete. Little progress in this respect appears to have been made by the Queensland Government Railways or the Tasmania Government Railways; the former continues to use the hook and screw coupling on freight stock, whilst in Tasmania a draw hook 2 ft. 7½ in. above rail level, is still standard.

On the Trans-Australian Railway of the Commonwealth Government Railways all trains, goods and passenger, are close coupled with automatic couplings, whilst on the Central Australia and North Australia railways of that administration the chopper-type centre buffer coupling is used.

On the Victorian Railways the auto-

matic centre coupling is almost universal; some 87 per cent of goods stock already had been fitted with it by the end of 1951. Many wagons are fitted with an automatic centre coupling and side buffers; when the coupling was fitted to existing stock it was the normal practice to install a transition chain, so that the coupling could either be automatic or by means of a draw-bar hook.

The position on the New South Wales Government Railways is similar to that in Victoria; the automatic centre coupling is standard, but a number of wagons still is equipped with side buffers.

On the South Australian Railways all wagons on the 5-ft. 3-in. gauge lines are equipped with the automatic centre coupling, but on the 3-ft. 6-in. gauge system a central buffer and drag hook is used.

The Western Australian Government Railways use the Norwegian and N.C.D.A. central buffer coupling.

Quick Changeover in Japan

The Japanese National Railways provide a remarkable example of a changeover from a screw-and-link coupling to an automatic centre coupling. Before 1925, the Japanese Government Railways, as they were then called, were working under a great disadvantage in that goods vehicles were equipped with a screw coupling at one end and a link coupling at the other; this made it necessary, when two units of the same type faced each other, to turn the wagons or to interchange coupling units between the two ends.

In the early 1920s, the management decided that the ever increasing volume of railway traffic necessitated an increase in the tractive power of locomotives which was not possible with the existing type of coupling. Furthermore, it was felt that the screw-and-link coupling was unsatisfactory for humanitarian reasons.

In determining its replacement by an automatic centre coupling, the following economies were anticipated: (a) reduction in the number of accidents; (b) decrease in maintenance costs; (c) reduction in turnaround time; (d) reduction in the number of locomotives required; (e) increase in the capacity of trains; and (f) reduction in the number of men engaged in coupling work, including the interchange of couplings at vehicle ends. In assessing the importance of these factors, regard must be had to the special considerations in Japan which are not applicable elsewhere.

After carrying out preparatory work, which included the reconstruction of the frame of all units so as to enable them to stand the changed stresses, and the training of all grades of staff in the principle involved, the final stages were completed on a single day in

July, 1925, when the movement of goods traffic was entirely suspended. All grades of staff co-operated in the conversion work.

At first an American-type coupler was used, but at a later date a Japanese design, the "Shibota," was adopted as standard. The draught gear is of a very simple type, consisting of front and rear followers, with a draught spring between them and a coupling yoke to hold them in position. The total cost at that time, in U.S.A. dollars, averaged \$144.4 a wagon; in 1951 it was estimated that the cost of the automatic coupling alone, excluding fitting costs, would be \$161.

After installation of the coupling, the Japanese Government Railways claimed that maintenance costs, which averaged 10.6 yen a wagon a year for the earlier type, were reduced to only 5.38 yen a wagon a year. During 1926 there was said to be a reduction of 68.9 per cent in the number of incidents of trains breaking in two, compared with the year 1924; coupling accidents, which resulted in three deaths and 206 staff injured in 1924, were reduced to no deaths and 38 injured in 1926.

East-West Division in Asia

In most countries in Southern and South-East Asia, except for India, Pakistan, and Ceylon, the automatic centre-buffer coupling has been in general use on all rolling stock, including goods wagons, for many years. This applies to the Far Eastern countries of China, Korea and Formosa, and also to Malaya, Burma, Siam, the Philippines and, to some extent, Indonesia.

Practices in India

In India, practices are, at the moment, somewhat varied. On the broad-gauge (5-ft. 6-in.) lines, screw couplings and slide buffers are still in widespread use, though trials have been carried out with the American M.C.B. type of automatic centre coupling. In 1957, it was stated that the Railway Board was planning the operation of heavier freight trains, up to a maximum gross weight of 3,000 tons. It was felt that the existing screw coupling would not be strong enough for such trains and further consideration is being given to adopting the automatic centre-buffer coupling as standard, because of its greater strength and safety, and of the possibility of speeding up marshalling. There would be, inevitably, a transition period during which screw-coupled and automatic-coupled wagons might have to run on the same train, and many wagons fitted with the automatic coupling might have to retain side buffers and be equipped with tran-

sition gear, so adding to the cost of conversion. On the metre-gauge and narrow-gauge lines, however, the automatic centre-buffer coupling has long been a standard fitting on all rolling stock.

The draw-hook and screw coupling is still used by the 5-ft. 6-in. gauge Ceylon Government Railways.

The screw coupling is still favoured on standard-gauge lines in Turkey, Syria, Israel, Iraq, and Persia. Various schemes for through running with Continental Enrope have had a considerable influence on the position throughout the years in the Middle and Near East.

U.S.S.R.

In Russia, after prolonged trials, including comparative tests of various types of automatic coupling, carried out in the early 1930s, the U.S.S.R. Railways announced that they proposed to adopt the automatic coupling as standard and that all new stock would be so fitted. Progress with conversion was slow, however, and at the outbreak of war in 1941 only 25 per cent of rolling stock had been converted, against a target of more than 50 per cent. Conversion work was still being carried out early in 1957, but it is understood that all rolling stock in Russia had been equipped with the automatic centre-buffer coupling by the end of last year.

In considering the U.S.S.R., it must be realised that virtually all new freight stock since the 1930s has been of the bogie high-capacity type with a load capacity in the 40-60-ton range. Such stock is, therefore, more comparable with the American than with the European type of wagon.

Early Introduction in U.S.A.

The first instance of the use of this form of coupling in the U.S.A. was in the 1860s, but the Janney coupler, introduced by the Pennsylvania Railroad in 1877-78 was really the precursor of the present-day standard M.C.B. (Master Car Builders' Association—now part of the Association of American Railroads) coupler. Comparative trials took place between different types of automatic couplers, and in 1888 a standard coupler, based on the Janney with certain modifications, was adopted.

Many accidents were at that time attributed to the use of the old link-and-pin method of coupling. In 1893 Congress passed the Safety Appliance Act, which made it obligatory that, after January 1, 1898, all wagons used in inter-State traffic must be equipped with couplings which would couple automatically on impact, and uncouple without a man stepping between them. Many types then came into use; but finally, in 1916, the M.C.B. Type "D" coupler was adopted as standard for freight cars on railways in the U.S.A., Canada, and Mexico. Since then various improvements have been effected. In 1953 the "F" type interlocking coupler was adopted for wagons

as an alternative to the "E" type introduced in 1932. Manufacture is subject to A.A.R. specifications. The "F" type is said to have reduced the free slack between knuckles by about 50 per cent, compared with the "E" type, and embodies several features of the "H" tightlock coupler used on passenger stock.

In Central and South America, most of the important railways have changed over to the automatic centre-buffer coupling, and in many cases the A.A.R. specification is used. Important exceptions are railways in the Argentine and some of those in Brazil where the early British influence has led to the retention of screw couplings on freight wagons with side buffers.

Africa

In Morocco, Algeria, and Tunis, the French practice has been closely followed. In Egypt, British principles have predominated until recently. It is not surprising, therefore, to find screw couplings and side buffers the normal practice on railways in these countries.

Most of the railways in South Africa, Rhodesia, East Africa, the Sudan and West Africa, are either of 3 ft. 6 in. or metre gauge, and the automatic centre-buffer coupling is practically universal for locomotives and both passenger and goods stock.

French West African Railway lines from Dakar, Conakry, Abidjan, and Benin to the Niger region are one exception; these lines use mainly the screw coupling, though efforts have been made recently to introduce the automatic centre-buffer coupling.

Europe and the U.I.C.

The design of rolling stock on all the standard-gauge railways of Continental Europe is very largely determined by the requirements of international working. The individual railways build most of their goods and passenger stock to conform to the requirements of the inter-Governmental Convention on Technical Unity and of the various agreements regulating the interchange of rolling stock; all of these call for the use of screw couplings and spring-loaded side buffers for all passenger and goods vehicles.

Although many electric multiple-unit sets and high-speed diesel passenger trains in France, Germany, Holland, and certain other countries have been equipped with the Scharfenberg or other special types of automatic centre-buffer coupling, all goods wagons in Western Europe, with a few very special exceptions (e.g. certain high-capacity mineral wagons), are equipped with screw couplings and side buffers.

Since the early years of the century, organised railway labour in Europe has been pressing for the installation of automatic couplings on all rolling stock. After representations made at the 1923 meeting of the International Labour Conference the problem was included in the programme of work of the International Union of Railways (U.I.C.). An Automatic Coupling Committee was set

up by the U.I.C. and still exists. Various reports were made recommending long-term steps by which the changeover to an automatic centre-buffer could be brought about. In July, 1936, the committee reported that from the economic point of view the replacement of screw couplings by automatic centre-buffer couplings would not be justified. The U.I.C. Board of Management then ruled that the extensive capital costs involved would not be justified by the results to be expected.

After the war of 1939-45, the U.I.C. reopened the question, on request from the Inland Transport Committee of the Economic Commission for Europe. In 1950, a further reference was made by the U.I.C. to the high cost of equipping all freight wagons with an automatic coupler, and further consideration was deferred pending governmental decisions on its desirability. The U.I.C. Automatic Coupling Committee has continued to study the problem.

Economics of the Automatic Coupling

In its request to the U.I.C., the Inland Transport Committee stated that by their failure to take action on this matter the European railways were responsible for death or injury caused to 200 men a year in coupling wagons by hand.

The U.I.C., however, considered that during the whole period 1929-37 approximately 53 fatal accidents would have been avoided by the introduction of the American type of automatic coupling. It was estimated that the overall cost in 1949, in U.S.A. dollars, of equipping 3,300,000 freight vehicles on various European railways with an automatic centre-buffer coupling would have been \$6,552 million, whilst the total economies to be realised over a 40-year period were assessed at \$982.2 million.

Western Europe is the last stronghold of the screw coupling and side buffer, largely as the result of the high economic cost and the need for international action to effect a changeover. As already stated, certain continental railways have equipped some special freight stock with automatic couplings; this stock is confined by its nature to special duties or workings. There is no evidence at present of any major departure in western continental Europe from the traditional use of screw couplings for goods vehicles.

Eastern Europe

In countries within the Russian sphere of interest, the position is not so clear cut. Before the last war, railways in Eastern Germany (then part of the former German State Railway) and countries such as Czechoslovakia, Poland, Hungary and Roumania, all conformed to the European standard screw coupling; but under Russian influence it is believed that the automatic coupling is being adopted as standard.

The East German State Railway has stated that at the end of this year all its goods stock will be equipped with automatic couplings.

Park Royal Railbuses for British Railways

Third of recent designs for service on rural branch lines

THREE of five 150-h.p. four-wheel railbuses built by Park Royal Vehicles Limited for British Railways for trial service on rural lines have been delivered; and as recorded elsewhere in this issue, they have been placed in service on the London Midland Region Bedford-Northampton and Bedford-Hitchin routes. The design is one of five for British Railways. It is the third to have been completed; the two previous were those of A.C. Cars Limited, described in our February 21 issue, and the German W.M.D.-built railbus described in our issue of May 23.

Leading particulars are:—

	ft.	in.
Overall length	43	4
Length over body	42	0
Width over body	9	3
Overall height—laden	11	8½
Floor height from rail	4	3
Wheelbase	19	8½
Wheel diameter	3	0
Tare weight	15	tons

Engine and Transmission

The B.U.T. "A" type 150 b.h.p. diesel engine is mounted adjacent to the non-driving axle. A Hardy Spicer cardan shaft drive is taken from the fluid fly-wheel through the freewheel to the S.C.G. R.14 four-speed air-operated epicyclic gearbox, and to the B.U.T. special ratio final drive unit mounted on the driving axle. This unit incor-

porates the air-operated forward and reverse gear change.

The cab is reached from the saloon. It is completely enclosed and glazed on all sides to the same height as the main windows. A full-drop window is fitted on the driver's left and also in the saloon on the right, opposite the cab. The cab has all gauges, controls and switches on the knee-hole type desk. The engine speed control on the left incorporates the deadman handle, and below the gear selector on the right is the forward or reverse selector.

Main Underframe and Suspension

The main underframe is an all-welded structure of pressed steel channel longitudinals and cross-members, with wide gusset plates at all junctions. The cross-member on the outside of the final drive is suitably braced to carry the load imposed by the torque reaction spring. The SKF roller bearing axleboxes are anchored to, and positioned by, leaf springs instead of the more normal horn guides.

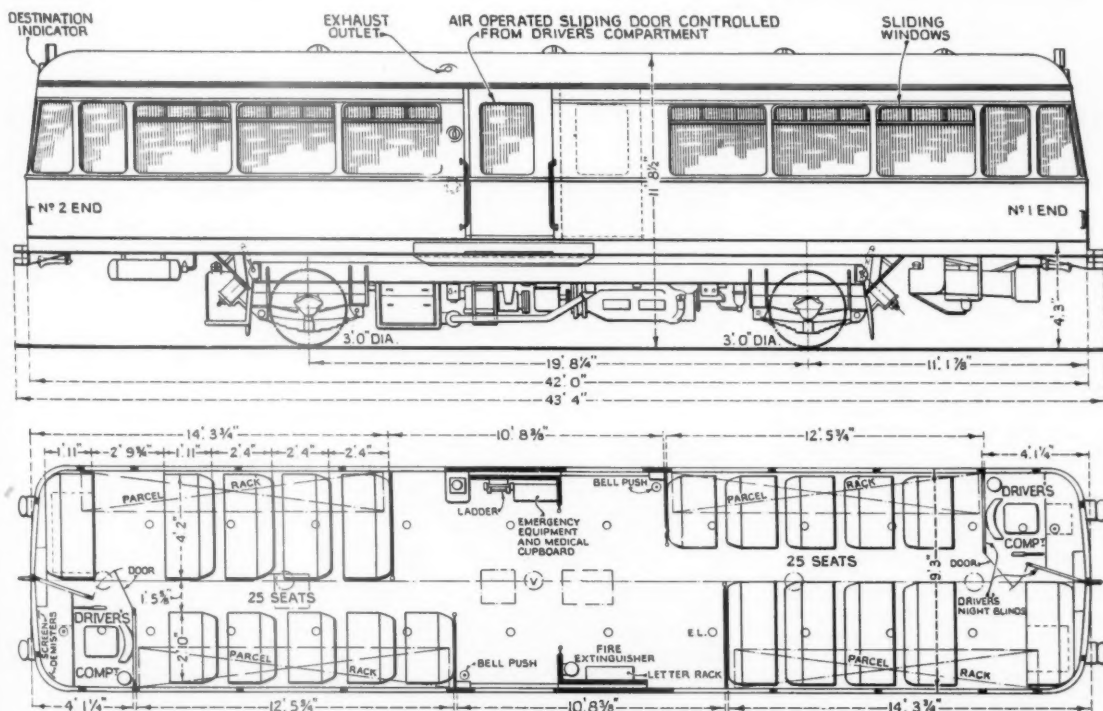
Traction and braking loads are taken through the spring which is anchored at the outer end, and free to slide on a roller at the inner end. An override abutment which limits the longitudinal or transverse axlebox movement in the event of a spring failure is pro-

vided in the axlebox mounting. Standard diesel car light-steel disc wheels of 3 ft. dia. are used.

One horizontally-mounted 6-in. dia. brake cylinder is used to operate the wheel rim clasp brakes for each axle set. The air compressor is driven by multiple vee-belt drive from the input side of the gearbox. A Neates type handbrake, fitted in each driving cab, operates through the power brake rigging on all wheels. All brake equipment auxiliary valves and fittings are positioned on the outside of the solebar to facilitate servicing.

The main body frame is carried on the underframe on four large compression coil springs. The anchor bolt on which the spring is hung is pivot-mounted in a bracket attached to the end cross-member of the underframe. A welded fabrication attached to the body frame transfers the car load to a pressure pad located on the top of the spring.

To accommodate traction and braking loads besides the main vertical load, the top of each spring is inclined towards the adjacent axle. Braking forces are thus taken on the two leading springs and traction forces on the trailing springs. An override abutment, which limits the relative longitudinal or transverse movement between body and underframe, is provided by four



General arrangement and layout of British Railways 150-h.p. railbus built by Park Royal Vehicles Limited



Four-wheel railbus, showing underfloor equipment and suspension

square section pillars. Ferodo fabric is used to prevent metallic contact on the overide checks. Woodhead-Monroe hydraulic shock absorbers are fitted to damp spring oscillation.

As the railbus is intended for single unit operation the conventional spring buffers are replaced by spring loop-form bumpers attached to the body underframe. A spring hook is also fitted to the body frame for emergency towing and depot use.

Twin interconnected fuel tanks having a combined capacity of 70 gal. are mounted at the driving axle end of the main underframe. Tank fillers are provided on each side of the vehicle. A separate fuel tank of 105 gal. capacity for the Smiths heater is mounted, with the heater under the body frame at the non-driving axle end.

Body Construction

The body underframe is a welded structure of steel channel longitudinals and cross-members, with diagonal bracing at each end. From the floor to the waist the interior 14 g. aluminium alloy panels are riveted to the light alloy vertical pillars, forming a stressed skin. Cast alloy brackets and a $\frac{3}{8}$ -in. thick aluminium alloy member are used to attach the bodyside to the body underframe. The exterior bodyside and roof panels are in 16 g. light alloy, the panels riveted to the steel top-hat section roof sticks forming part of the stressed skin. The roof coves are in 18 g. aluminium and below each doorway is an 11-in. deep steel stiffener. Corrugated light alloy planks bolted to the bearers form the floor. Sound insulation is provided by a layer of Limpet asbestos and on this is a layer of resin-bonded $\frac{3}{8}$ -in. thick ply.

Interior Arrangement and Seating

The central air-operated sliding door in each side opens into a relatively large vestibule 10 ft. 8 in. long. Waist height partitions, with a handrail on top, form the division between vestibule and seating portion at each side. The seating arrangement for 50 passengers can be seen in the diagram.

The tubular seat frames are fitted with Dunlopillo cushions and Hairlock squabs, trimmed with blue patterned cut moquette. Blue Vynide is used for the body panel trim up to the waist, with grey from waist to top of roof cove. The centre lining of the roof is in Limpet hardboard, painted eggshell grey. Floor covering is blue linoleum. Light parcel racks are fitted over each back of seats. The 12 large side windows are each fitted with two sliding ventilator windows at the top. Inside window ledges are avoided by bringing the rubber glazing strip flush with the body side. Beclawat full-drop lights are fitted adjacent to the fixed corner lights which are radiused to the body contour. At each end are two large fixed lights with central dividing pillar.

Car heating with filtered air is by Smiths fuel-oil-fired combustion heater, this also supplying the screen demisters in the cab. The heater is mounted

longitudinally under the body frame. Five roof ventilators are fitted for air extraction. Control of the passenger entrance doors is from the driver's cab, with the addition of release cocks at the doors for release in an emergency or depot staff use.

Electrical Equipment

Interior lighting is by a double row of open reflector lights positioned over the seats. The 24 V., 200 A.-h. Nife batteries, with provision for external charging, are mounted in two containers slung one on each side of the under-underframe.

The a.c. generator C.A.V. type AC8 is belt-driven from the input to the gearbox at 2.8 times engine speed. At engine idling speed the minimum output is 30 A., with an output of 50 A. maximum at the governed engine speed of 1,800 r.p.m. A C.A.V. UN 411 germanium rectifier is used to rectify the a.c. current.

The remaining two vehicles of the order are to be delivered to the Scottish Region; both will have a form of automatic folding passenger steps, and the last vehicle will be fitted with the recently developed C.A.V. fully automatic control.

Sub-contractors include:—

Engines, transmission and control gear	British United Traction Limited
Power frame and body underframe sections	John Thompson (Motor Pressings) Limited
Air brake equipment	Clayton Dewandre Limited
Wheels and axles	John Baker & Bessemer Limited
Axleboxes	Skefko Ball Bearing Co. Ltd.
Laminated and coil springs	Jonas Woodhead & Co. Ltd.
Charging equipment	C.A.V. Limited
Batteries	Nife Batteries Limited
Insulation and asbestos	J. W. Roberts Limited
Main side windows	Hallam, Sleigh & Cheston Limited
Full drop windows	Beckett, Laycock & Watkinson Limited
Seat frames and power door gear	G. D. Peters & Co. Ltd.
Luggage racks	Deans & Sen (Yorkshire) Ltd.



Seating arrangement with fixed seats facing away from centre vestibule; cab is on left at end

RAILWAY NEWS SECTION

PERSONAL

Mr. P. D. Proctor, a Deputy Secretary in the Ministry of Transport & Civil Aviation, will succeed Sir John Maud as Permanent Secretary to the Ministry of Power on October 1.

Mr. R. C. Bond, M.I.C.E., M.I.Mech.E., M.I.Loco.E., Chief Mechanical Engineer, British Railways Central Staff, has been

tive testing station at Rugby. On the outbreak of war in 1939, he was appointed Acting Mechanical & Electrical Engineer, L.M.S.R., Scotland. He became Works Superintendent, Crewe, in May, 1941, and, in November, 1946, Deputy Chief Mechanical Engineer. He was appointed Chief Officer (Locomotive Construction & Maintenance) to the Railway Executive, H.Q., in January, 1948. Mr. Bond was appointed to the British Railways Central

Mr. D. S. M. Barrie, M.B.E., A.M.Inst.T., Chief Public Relations Officer, British Transport Commission, who, as recorded in our August 8 issue, has been appointed Assistant Secretary General, B.T.C., was born at Newport, Monmouthshire, in 1907. He was educated at Tonbridge School. After eight years' experience on the editorial staffs of various national and provincial newspapers, he joined the former L.M.S. Rail-



Mr. R. C. Bond

Appointed Technical Adviser to the British Transport Commission



Mr. D. S. M. Barrie

Appointed Assistant Secretary General, British Transport Commission

appointed to succeed Mr. John Ratter as Technical Adviser at Commission Headquarters on October 1, this year. Mr. Bond was educated at Tonbridge School, and served his apprenticeship at Derby Locomotive Works, later becoming a pupil of Sir Henry Fowler. He was for some time in charge of the inspection of locomotives under construction for the L.M.S.R. by locomotive building companies and, in 1928, he was appointed Assistant Works Manager at the Vulcan Foundry Limited. During that time he went to India to supervise the erection of electric locomotives for the Great Indian Peninsula Railway main-line electrification. Three years later he returned to the service of the L.M.S.R. as Assistant Works Superintendent, Horwich, and, in 1933 became Assistant Works Superintendent, Crewe Locomotive Works. He subsequently became Superintending Engineer, responsible jointly to the Chief Mechanical Engineers of the L.M.S.R. and L.N.E.R., for the design of the loco-

Staff as Chief Mechanical Engineer in 1954. He was President of the Institution of Locomotive Engineers, 1953-54, is a Member of Council of the Institution of Mechanical Engineers, and a Lt.-Colonel in the Engineer & Railway Staff Corps.

The following appointments have been announced by the Southern Region of British Railways in connection with the traffic reorganisation referred to editorially this week:—

Mr. S. A. Fitch, Chief Operating Superintendent, as Assistant General Manager (Traffic);

Mr. P. A. White, Assistant Operating Superintendent (Modernisation), as Line Traffic Manager, South Eastern Division;

Mr. W. H. F. Mepsted, Chief Operating Superintendent, as Chief Development Officer.

Mr. A. Earle Edwards has been appointed Operating Officer; Mr. G. Wynne Davies as Commercial Officer, and Mr. G. A. Weeden as Motive Power Officer.

way in 1932. From 1941 to 1946, he served with the Royal Engineers at home and overseas, attaining the temporary rank of Lieutenant-Colonel. He was awarded the M.B.E. and the United States Bronze Star Medal for his war services. Returning to the L.M.S.R., Mr. Barrie was appointed Assistant Advertising & Publicity Officer and, in 1948, became Public Relations Officer to the Railway Executive. In 1953 he was appointed Public Relations Officer, British Transport Commission, becoming Chief Public Relations Officer in 1956. He was Chairman of the British Railways Public Relations Committee, 1948-53, and has been Chairman of the Public Relations & Publicity Committee since 1956. Mr. Barrie is a Member of Council of the Institute of Transport and Chairman of its Visual Aids Committee. He is a Member of the Institute of Journalists, and a Vice-President of the Railway Club. He has written and broadcast extensively on transport matters.

Mr. F. G. Marshall, Electrical & Signal Engineer, Ulster Transport Authority, has resigned.

Mr. J. F. Harrison, M.I.Mech.E., M.I.Loco.E., Chief Mechanical & Electrical Engineer, London Midland Region, British Railways, who, as recorded in our July 25 issue, has assumed responsibility for the overall direction of mechanical and electrical engineering work of the region, will cover the Chief Mechanical and Electrical Engineering and the Carriage & Wagon Departments, and the

We regret to record the death, on August 4, of Mr. A. Moss, M.Inst.T., M.I.R.S.E., former Signal Engineer, Eastern Region, British Railways. Mr. Moss began his career in the Signalling Department of the former Great Central Railway in 1906. During the 1914-18 war, Mr. Moss served with the Royal Engineers (Signals) and, on demobilisation, he rejoined the Great Central until amalgamation when he was transferred to the L.N.E.R. Signal Engineer's office. In 1926, he became Indoor Assistant in that department and, five years later, was

and colour-light signals. After his appointment to the Eastern Region in 1948, he completed the Doncaster re-signalling scheme involving the sequence switch interlocking which had been initiated by his predecessor. He was also responsible for the very extensive re-signalling works associated with the Liverpool Street-Shenfield electrification which incorporated, for the first time on an extensive scale, the principles of route relay interlocking controlled by switches arranged on a geographical basis and mounted on a diagram panel. A further development



Mr. J. F. Harrison

Chief Mechanical Engineer, L.M. Region,
whose position has been enhanced



The late Mr. A. Moss

Signal Engineer, Eastern Region Region,
British Railways, 1948-56

technical aspects of the Motive Power and Road Engineer Departments. Mr. Harrison was educated at Malvern Wells and Wellington College. He joined the former Great Northern Railway in 1921 and became a pupil at Doncaster Works. He was Supernumerary Foreman in the Locomotive Running Department of the former L.N.E.R. at Doncaster and, later at Kings Cross. He became Running Shed Foreman in charge of Wigan and St. Helens in 1926; Technical Assistant to the Locomotive Running Superintendent at Liverpool Street in 1929; Assistant to Locomotive Works Manager, Gorton, in 1930; Assistant Locomotive Works Manager, Doncaster, in 1937; Locomotive Works Manager, Gorton, in 1938; Mechanical Engineer, Gorton, in 1941; Mechanical Engineer, Cowlairs, in 1945; Assistant Chief Mechanical Engineer at Doncaster in 1947; Mechanical & Electrical Engineer, Eastern & North Eastern Regions, in 1950, and, in 1951, Mechanical & Electrical Engineer, London Midland Region.

appointed Chief Assistant (Signals) to the Engineer (Scotland). In 1933, he was appointed Signal & Telegraph Assistant to the Engineer (Scotland), becoming Signal & Telegraph Engineer, Scottish Area, in 1936. He returned to London in 1943, on his appointment as Assistant to Engineer (Signals) at Kings Cross and became Signal & Telecommunications Engineer, Eastern Region, British Railways, on nationalisation in 1948. Mr. Moss was elected a Member of Council of the Institution of Railway Signal Engineers in 1933, and served continuously in that capacity until 1946, when he was elected a Vice-President. He was President of the Institution for the year 1948-49. While he was in Scotland, Mr. Moss was responsible for the introduction of multi-aspect colour-light signalling between Glasgow and Kelvinhaugh, together with various automatic intermediate block sections, and the complete re-signalling of Edinburgh Waverley Station, incorporating full power operation of points

of this principle was carried out at Potters Bar, where the panel switches were mounted on a separate console carrying in miniature a replica of the layout. In addition, Mr. Moss was responsible for carrying out the ground installation of the experimental equipment of automatic train control between Kings Cross and Grantham, and for planning of signalling on the extension of the Liverpool Street-Shenfield electrification to Chelmsford and Southend (Victoria). Mr. Moss was a Member of the Institute of Transport.

The funeral took place at Marylebone Crematorium, London, on August 8. The Rev. W. I. Bulman officiated. In addition to family mourners the following were among those who attended:—

Mr. E. A. Boothroyd, British Transport Commission; Mr. R. A. Green, Signal Engineer, Eastern Region, British Railways (also representing the General Manager, Eastern Region, and the Stratford Technical Society); Mr. F. B. Eggington, Mr. E. A. Rogers, Mr. A. K.

Terris, Mr. L. Tuff, and Mr. E. D. Trask, Eastern Region, British Railways; Mr. E. G. Brentnall, and Mr. S. Williams, formerly London Midland Region, British Railways and now of Henry Williams Limited; Mr. J. C. Kubale, Metropolitan-Vickers-G.R.S. Limited; Mr. E. J. Beavan (representing Mr. D. J. O. Kidd, Managing Director), Railway Signal Co. Ltd.; Mr. F. L. Castle, and Mr. J. Sulston, Siemens & General Electric Railway Signal Co. Ltd.; Mr. Frank Horler, formerly of Siemens & General Electric Railway Signal Co. Ltd.; Mr. M. V. Shorter, Mr. T. J. Aldridge and Mr. C. F. D. Venning, Westinghouse Brake & Signal Co. Ltd.; Mr. J. D. Benjamin, W. T. Henley Telegraph Works Co. Ltd.; Mr. T. Tritton (representing Mr. B. W. C. Cooke, Editor), *The Railway Gazette*.

The British Transport Commission announces the following appointments:—*British Railways Central Staff*

Mr. H. L. Preston, Senior Technical Assistant (Electrical Multiple-Unit Equipment), Electrical Engineering Department, to be Senior Technical Assistant (Inspection).

Finance Department, B.T.C.

Mr. J. E. Clark, Assistant, Accounts & Statistics Division, to be Senior Assistant, Area Management, Costs & Statistics Panel.

Mr. D. H. Bickers, Assistant Traffic Costing Officer, Costing Division, York, to be Traffic Costing Officer, B.T.C. Headquarters.

We regret to record the death, in Wellington, New Zealand, of Mr. William Bishop, Chief Accountant, New Zealand Government Railways from 1936 to 1943. Mr. Bishop joined the railways as a cadet at Dunedin in 1901. In 1913 he was appointed Stationmaster at Waitati, and in 1914 Assistant Relieving Officer at Dunedin. He was made a clerk in the District Traffic Manager's office at Dunedin in 1915 and at Wanganui in 1920. Between 1924 and 1926, Mr. Bishop was associated with Mr. H. Valentine in the reorganisation of the Railway Department's financial and accounting system. He also played an important part in the mechanisation of accounting procedure. In 1926 he became Supervising Accountant in the Chief Accountant's office. The following year he was made Assistant Chief Accountant, and was appointed Chief Accountant in 1936. Mr. Bishop was a member of the New Zealand Society of Accountants.

Arising out of the transfer of the Northern Ireland section of the Great Northern Railway to the Ulster Transport Authority, which is to take place on October 1, it has been arranged, so as to facilitate the transfer, that Mr. J. C. Baillie, M.Inst.T., at present Traffic Manager, Great Northern Railway Board, be seconded meantime to the service of the Authority. Until the transfer date, he will continue to discharge his duties as Traffic Manager of the G.N.R. Board.

Mr. J. E. L. Robinson has been appointed a Director of Associated Engineering Limited and will assist the Group Managing Director.

We regret to record the death on August 4, at the age of 76, of Mr. E. S. Sturrock, South African Minister of Transport from 1939 to 1948.

We regret to record the death of Mr. L. P. St. Hilaire, General Agent, Passenger Department, Quebec, Canadian Pacific Railway. He has been succeeded by Mr. J. Caouette.

Thos. Cook & Son Ltd. announce the following appointments:—

Mr. A. H. Browne, Manager, Holborn branch, as Manager, Gracechurch Street branch in the place of Mr. J. W. P. Phillips, who succeeded Mr. L. F. Olney as Controller, Home Counties & Ireland Area. Mr. A. D. Spoor, Manager, Birmingham (Victoria Square) branch, as Manager, Bradford office following the retirement of Mr. J. Lambert. Mr. A. R. Franklin, Manager, Newcastle branch, as Manager, Birmingham (Victoria Square) branch. Mr. W. Cuthbert, Manager, Glasgow (St. Vincent Street) branch, as Manager, Newcastle-upon-Tyne branch. Mr. F. Curtis, Manager, Kensington branch, as Manager, Holborn branch. Mr. R. Bolton, Branch Manager, Stockholm office, as Manager, Kensington branch. Mr. K. G. Johannessen as Manager of the new office at San Diego, U.S.A.

British Insulated Callender's Construction Co. Ltd., announces the following administrative changes; Mr. G. H. Walton, Joint General Manager has retired, while remaining available for consultation and for special duties. He retains his seat on the Boards of B.I.C.C. and of British Insulated Callender's (Submarine Cables) Limited, Painter Bros., Limited, and Engineering Projects Limited. Mr. O. J. Crompton has been appointed General Manager of the Company; Mr. G. A. Rendle becomes Deputy General Manager, while continuing to act as Manager, Power Cable and Telecommunication Cable Contracts Departments; Mr. E. T. Q. Davies has been appointed Director. He also continues to act as Manager of the Overhead Line Contracts Department. Mr. F. B. Kitchin has retired from the board of B.I.C.C. and of British Insulated Callender's Cables (Australia) Pty., Limited.

Miss Dorothy Smith, Motor Engineering Department, Metropolitan-Vickers Electrical Co. Ltd., has been elected a Member of the Institution of Electrical Engineers. Until this year, no woman has achieved this distinction since 1899.

Mr. James J. Stewart has been appointed Manager, Adelaide Branch, Victorian Government Tourist Bureau, he succeeds the late Mr. Gordon K. Peart.

Mr. R. G. Tant, Technical Representative, Speed Nut Division, Simmonds Aerocessories Limited, is visiting Amsterdam on business.

Mr. R. J. Barritt has been appointed Chief Executive, Engineering Division, the British Oxygen Co. Ltd., from September 1.

Sir Leslie Rowan, Second Secretary of the Treasury, has been nominated for appointment to the board of Vickers Limited on his retirement from the Civil Service towards the end of the year.

Mr. W. T. N. Walford, Buying Manager, Dunlop Rubber Company in Birmingham, has been elected Chairman, Birmingham branch of the Purchasing Officers' Association in succession to Mr. A. B. Smith, Chief Buyer & Executive Director, Rover Company.

Mr. Paul N. Matton, Managing Director of Trico-Folberth Limited, has been nominated President of the International Jury to adjudge and allocate Awards to

Exhibitors in the Road Transport Classifications of the Brussels Universal & International Exhibition. The jury consisted of 3 Belgians, 3 Frenchmen, 3 Russians and an Italian.

Mr. G. Millington, Chief of Propagation Section, Marconi Wireless Telegraph Co. Ltd., has been nominated Chairman-elect, Radio & Telecommunications Section committee, Institution of Electrical Engineers, for the forthcoming year.

Mr. P. T. Ensor, formerly General Manager, Canadian British Aluminium Co. Ltd., has returned to the U.K. and has been appointed assistant to Mr. G. W. Lacey, Commercial Director of the British Aluminium Co. Ltd.

Mr. John Collins, Commercial Manager Liverpool and Netherton Works, English Electric Co. Ltd., has been elected Chairman of the Mersey & North Wales Centre, Institution of Electrical Engineers for the 1958/59 session.

Mr. R. G. Holland has been appointed Assistant Cable Sales Manager, Special Contracts, Siemens Edison Swan Limited. Mr. R. B. Tucker has been appointed Assistant Sales Manager, Rubber & Plastic Cable Division.

Mr. R. Bate, Sales Director of Enfield Cables Limited, has resigned to take up a post outside the electrical industry. Mr. G. B. Russell has been appointed Home Sales Manager from September 1 and will remain Manager of the Contracts Department.

Mr. H. E. Cox, General Manager, Rugby Works, British Thomson-Houston Co. Ltd., has been appointed a director.

Mr. G. P. Balfour has been appointed Managing Director of Stockdale Engineering Limited.

Mr. A. D. Mackay has resigned from the board of Associated British Engineering Limited.

We regret to record the death on August 1, at the age of 61, of Mr. G. C. Duncan Wiggins, Railway Superintendent, Port of London Authority. Mr. Wiggins joined the Authority in 1913 in a junior capacity and after some years of duty in the various departments of the Dock Superintendent was transferred to the Railway Department in 1927 as an Assistant Railway Inspector. Apart from service in the Royal Artillery in the 1914-18 war when he attained commissioned rank and a period of five years during the recent war when he was seconded to the London Coal Tipping Control, the remainder of his 45 years with the Authority was spent in the Railway Department. In 1947, he was appointed Railway Superintendent, the position he held at the time of his death. Mr. Wiggins was a Member of the Institute of Traffic Administration.

INSTITUTION OF CIVIL ENGINEERS

The Institution of Civil Engineers announces the following transfers and admissions:—

Associate Member to Member

Mr. W. F. Adams, Ministry of Transport & Civil Aviation.

Mr. A. I. W. Jones, Nigerian Railway Corporation.

Associate Member

Mr. P. Ganendra, Malayan Railway.

NEW EQUIPMENT AND PROCESSES



Combined Welding Shield and Safety Helmet

A COMBINED welding shield and safety helmet has been designed. It is intended for use in welding operations in exposed positions where a form of head protection is required, such as on heavy construction work.

Both the shell and face shield are moulded in glass fibre for impact resistance and high dielectric strength. Other features include a soft leather apron fitted at the base of the face shield to reduce the risk of light infiltration from below.

The inside of the crown is specially padded for shock absorption. An adjusting device on the welding shield enables it to be swung up out of the way when not wanted. The hinges are insulated with nylon screws. The various features of the shield are seen in the accompanying illustration. Sizes of headbands, which are interchangeable, range from 6½ to 7½. Separate headbands cost 5s. 6d. each. The price is 85s. each and delivery is

within seven days. The shield is made by R.D.F. Co. Ltd., Godalming, Surrey, from which company further details may be obtained.

Tube Cleaning Process

A PROCESS, and the necessary associated equipment, has been evolved for cleaning the internal surfaces of tubes and piping. A small range of simple attachments enables practically any shape or size of tube from ¼-in. bore or larger to be cleaned. This technique is of application to manufacturers of steam and diesel locomotives and most railway installations where piping is involved. The essential part of the equipment is the machine which incorporates a pressure/vacuum system for abrasive feed and recovery with a thorough segregation of grit, slag and dust.

In this process the tube is used to replace the normal gun with the pressure and vacuum hoses connected at opposite ends, the closed circuit being maintained within the tube body. According to the varying sizes of tube, different methods are employed.

In the case of tubes of ¼-in. bore the blow-through method is used but the cross-sectional area of the subject items must be greater than the area of the blast nozzle. Usually a nozzle of ⅜-in. bore is used, the tubes being nested to give a cross-sectional area of over 0.077 sq. in. Tubes in the range of bore sizes ½ to 2 in. may also be cleaned on the blow-through principle but the nozzle is now offered direct to the mouth of the tube. Above this size the nozzle can be entered into the tube and traversed right along the work surface. The usual method is to pass the nozzle to the far end of the tube and then switch on the blast stream by means of a foot switch, withdrawing the nozzle slowly whilst blasting is in progress.

Besides simple attachments, a more specialised item has been developed for cleaning large bore straight tubes, which has two rotating blast nozzles.

Full details of this process may be obtained from Vacu-Blast Limited, Bath Road, Slough, Bucks.

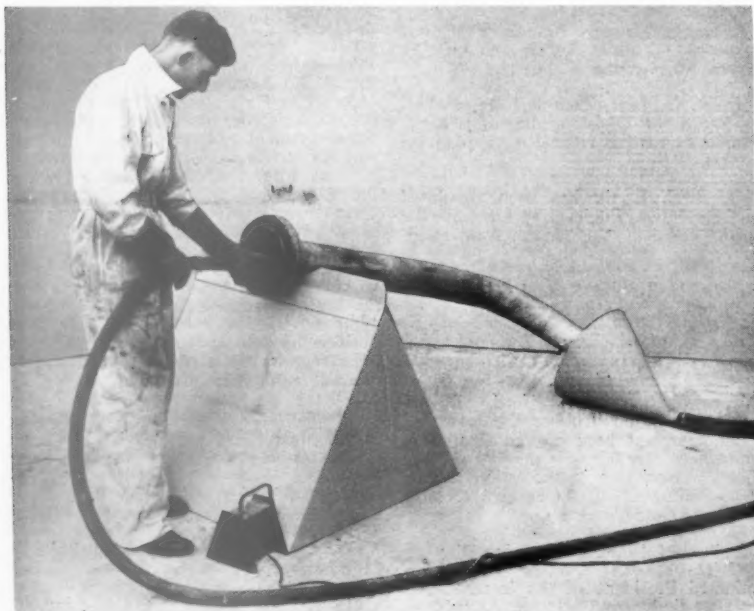


Improved Impact Wrench

SOME modifications have been made to the manufacturer's type 404 impact wrench as a result of practical experience in industry. This has resulted in an improved performance and reliability.

The tool has a maximum capacity rating of 600 lb.-ft. torque at 80 lb. per sq. in. air pressure, and it is suitable for a wide range of uses such as nut tightening and removal, rock bolting, and plate drawing. By means of special accessories the 404 can also be used for drilling, reaming, tapping, screw driving and removing screws and broken studs, besides tube expanding and cleaning and so on.

The torque reaction of the tool is stated to be negligible. When sufficient resistance to turning is met, impacting commences and continues until the nut is either fully tightened or released. The wrench is driven by a cartridge vane type motor, the impact being delivered by a hammer impelled by high pressure generated by the cam action. There is a rapid acceleration of the striking hammer in



this new design, which results in a very high impact value.

The illustrations on page 196 show the tool being used for permanent way maintenance work. The upper illustration shows it inserting $\frac{1}{2}$ -in. coach screws; the lower, tightening fishplate bolts.

For comparative purposes, the torque (approximate) required to move a $\frac{1}{2}$ -in. nut impacted for 15 sec. at various pressures is as follows:—60 lb. per sq. in., 400 lb.-ft.; 70 lb. per sq. in., 500 lb.-ft.; 80 lb. per sq. in., 600 lb.-ft. The governed free speed is 750 r.p.m. and the power output on load is one b.h.p. Air consumption is 54 cu. ft. per min. The wrench weighs 21 lb. and measures 16 in. in length; the output spindle takes 1 in. square drive chucks.

The price is £79 18s., including one socket; further details may be obtained from the manufacturer, Holman Bros. Ltd., Camborne, Cornwall.

Heavy Duty Concrete Floor Paint

A HEAVY duty concrete floor paint, Pitacrete, is intended to produce a coating with hard-wearing properties. It resists petrol splash, mineral oils, weak acids and alkalis, and is quick-drying, being touch-dry within one hr. It eliminates dust and gives good resistance to abrasion and the surface is washable with soap or detergent.

For new floors a setting period of 14 days should be allowed before painting begins. Then two coats of Pitacrete should be applied by brush allowing 24 hr. between each coat. On old unpainted floors two coats are also applied after ensuring that the surface is clean and dry.

With old floors already painted, all loose flaking paint must be removed and the surface made clean and dry. Two coats of Pitacrete are applied as before; but it is advisable, when treating a floor already painted, to apply a small test patch to ensure there is no interaction between old and new paint.

The covering capacity is first coat, 40 sq. yd. per gal. approx.; second coat, 50 sq. yd. per gal. approx. depending on the porosity of surface. The paint is available in dark red, medium grey, or verdigris green.

The price is 55s. a gal. The paint is available ex stock in one- and five-gal. containers. Further details may be obtained from the manufacturer, All-weather Paints Limited, 36, Great Queen Street, London, W.C.2.

Oil Drum Stacking Truck

A TRUCK designed for handling and stacking drums of oil or chemicals, the Jacacaddy Drum Stacker, is used by the National Coal Board and is now generally available.

Two $2\frac{1}{2}$ -in. dia. steel rods, 2 ft. 9 in. long, are mounted at each end of a heavily constructed backplate which is raised and lowered hydraulically. The two steel lifting rods run almost the length of a standard drum and hold it securely.

40-gal. drums, which weigh approximately 5 cwt., are lifted easily from the floor to heights of up to 5 ft. 8 in. by the standard model by hand or power operation, and up to 10 ft. by a higher lift version incorporating an extended lifting frame. This latter model is termed a High-lift Drum Stacker.

Special rack units can be supplied. The basic section of these holds two 40-gal. drums in a horizontal head-on position. These racks can, however, be supplied as an integral unit to store three drums (3 ft. high \times 3 ft. wide) or any intermediate size.

Details may be obtained from the manufacturer, W. Langley & Co. (Mechanical Handling) Ltd., 14-16, Magdalen Street, London, S.E.1.

Industrial Power Sweepers

A RANGE of industrial power sweepers manufactured in this country with the trade name Matling-Wilshire, can be used on station platforms and in station and other railway buildings, sidings, workshops and similar installations.

Three basic models are being produced; these are the Wilshire Series 800, the Three-Way Maintainer, and the Super-Safe Multi-purpose Series 1200. The last named is the largest of the three and is typical of the range.

The machine is arranged with a dust shield in front and the dust bag located behind the operator protecting him when sweeping dusty areas. The cushioned seat and back rest, accessible instrument panel and controls conveniently located, are stated to eliminate operator strain and fatigue. The hopper control is located at the operator's left hand and permits him to back up to the dumping area, dump the contents and pull away without leaving his seat.

Travel speeds up to 15 m.p.h. can be obtained. An inspection door on top of the hopper makes it easy to inspect hopper contents.

The engine is an 8-h.p. four-stroke, air-cooled type; a four-gallon petrol tank is fitted. Transmission is by vee-belt drive through free-acting clutches to the three-speed and reverse gearbox. Chain drives are arranged between engine, differential and road wheels. The last named are 12 in. \times 3 in. solid rubber tyres on steel hubs with sealed ball bearings. Two pairs, chain driven, are at the rear, the front having one pair, steered.

The Wilshire patent brush reel arrangement of semi-floating 24-in. dia. 8-vane spider with 16 Supersweep brushes is easily fitted or changed—and is reversible,



end for end. Brushes and sweeping chamber are completely dust sealed by rubber flaps but are readily accessible through large inspection covers. A side sweeper is an optional extra, one 21-in. dia. brush adding 12 in. to path swept.

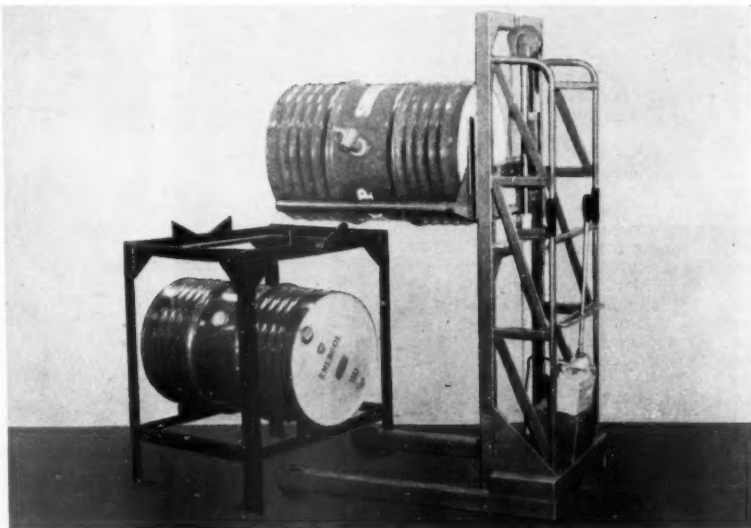
Further details may be obtained from the manufacturer, Matling Limited, Fallings Park, Wolverhampton.

Double-Sided Adhesive Tape

A TAPE with adhesive on both sides, Twinstik, consists of a thin tissue impregnated with a pressure-sensitive adhesive and protected with a treated paper. It is available in a variety of widths up to 12 in. and can be applied to most surfaces to provide a strong durable bond. To apply the tape, it is unrolled and applied by hand to a surface and the paper cover is peeled off. This leaves the outer adhesive surface exposed; to this surface light articles or sheet material can be applied to form an immediate bond. The adhesive is strong, and can exert a considerable pull.

The absence of solvents in the adhesive surfaces makes the tape suitable for use on cellulosed and other surfaces.

Twinstik tape is manufactured by Evode Limited, Common Road, Stafford.



Ministry of Transport Accident Report

*Staines Central, August 9, 1957:
British Railways, Southern Region*

Brigadier C. A. Langley, Inspecting Officer of Railways, Ministry of Transport & Civil Aviation, inquired into the accident which occurred at 12.25 p.m. on August 9, 1957, at Staines Central when the eight-coach electric train, formed of two four-coach units from Windsor and Weybridge coupled together there, due to depart for Waterloo at 12.24, left against the starting signal at danger and collided 215 yd. further on at about 20 m.p.h. with a light engine, being correctly shunted from the up loop to the down main and which was moving at about 10 m.p.h.

The engine was overturned but its tender remained upright though derailed all wheels. The leading bogie of the colliding train was completely derailed and the off side of the front coach demolished, with some other damage, but fortunately casualties were light. Only 12 of the 70 passengers suffered minor injuries or shock. The motorman escaped with cuts and bruises but the driver of the engine had his leg broken and his fireman was injured. Current was cut off by short circuit and then from the sub-station.

Help was summoned by telephone from a nearby firm and speedily arrived; nine

Rules 141, 143 and 148, regarding the starting of trains and observing of signals. These provide, among other things, that the giving of the "right away" signal means simply that station duties, etc., are finished and that responsibility for seeing that the fixed signal is "off" remains with the driver. Guards are required to keep a good look-out when leaving stations and on other parts of the journey; should a guard see reason to apprehend danger he must make every effort to attract his driver's attention, or that of a signalman. In addition the report refers to the Rules in the Southern Region Appendix regarding passengers travelling in guards' compartments; these, among other things, permit ordinary passengers to travel in brake compartments during busy periods and at other times as circumstances warrant, at the discretion of stationmasters and guards, but such permission applies solely to the compartment in which the guard rides and no other, in any circumstances.

Course of Events and Evidence

The signalman said that the second portion of the train arrived for coupling up at 12.21 and he had sufficient time to cross

quickly and when he looked forward again was rounding the curve and had nearly reached the bridge, at some 30 m.p.h., when he saw the engine, promptly released his dead man's handle, applied the emergency brake and threw over the brake valve handle.

The guard, who also had come with the front portion of the train from Windsor, watched the coupling up of the second and then tested the brake from the rear of the complete train. A lady with a pram containing children came to his van and as she wished to travel only to the next station, Ashford, he placed the pram in the van and permitted her to ride with it. He gave his green hand signal which was relayed forward by a porter. He could not close his door immediately, as he had to move the pram to do so, and by then they were past the starting signal, which he did not observe.

The porter said he had never previously intimated to a guard that station work was finished without checking the condition of the starting signal, but to do so he would have had to walk forward one or two coach lengths and then back to see the guard. The foreman, who came on

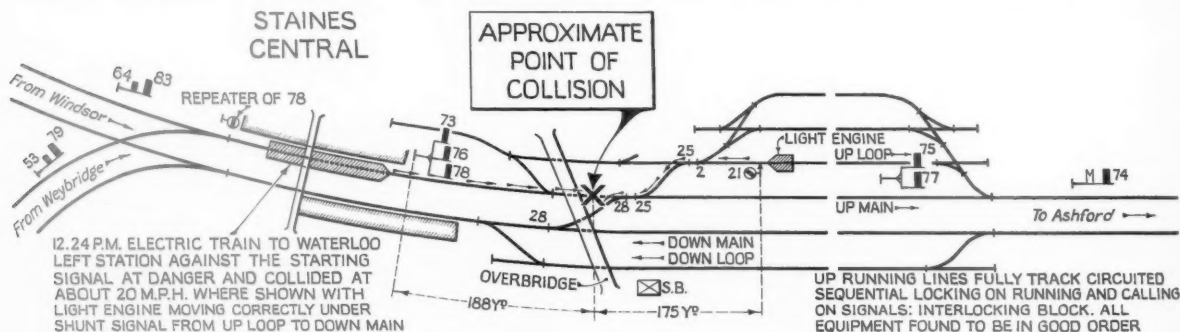


Diagram showing circumstances of accident at Staines Central, British Railways, Southern Region, August 9, 1957

of the injured were taken to hospital within half an hour but only the driver of the engine was detained. Both lines were blocked but emergency train and bus arrangements worked very smoothly and normal traffic was resumed at 8.16 p.m. It was fine and clear with dry rails.

The accompanying diagram shows the lines, signals, etc., essential to an understanding of the case. Curvature and the bridge restrict the view of the up loop from an approaching train and wagons in the yard siding formed a further obstruction; the motorman could not see the engine until 70 yd. from the point of collision. The signalman cannot see the inner home No. 78—forming the platform starting signal, nor an up train until close to the bridge. The platform canopy prevents station staff from seeing this signal until about 60 yd. from the end of the platform, opposite the rear compartment of the third coach of an eight-car train. The guard could not see either the signal or his motorman and his "right away" signal had to be relayed by the staff.

The report gives relevant extracts from

the light engine, which had finished its work and required to go to Weybridge. He therefore set the road and cleared ground signal No. 21. The engine had reached the up line when his signal lad called out that the train had left the platform; the collision occurred almost immediately. "Obstruction danger" was then sent and a message to Woking Control asking for current to be cut off. This evidence was confirmed by the signal lad.

The driver of the engine said he was travelling at about 10 m.p.h. when he saw the train but had no time to brake. The fireman did not notice it until too late to shout a warning.

The motorman said signal 78 was "on" when he arrived with the front portion of the train and he watched the second follow in, saw it attached and then tested the brake in conjunction with the guard. The signal was still at danger but unfortunately instead of waiting for it to be cleared—his usual custom—he looked back to see if station work was completed. A foreman passed forward the "right away" given by a porter. He frankly admitted having started without looking at the signal. He accelerated

the platform just as the train was ready, repeated the porter's hand signal. He could not see the fixed signal but assumed the porter had checked its indication. It was the invariable practice of the staff at Staines to see the signal was "off" before intimating that a train was ready to start.

A relief clerk alighted from the second portion of the train to call on the stationmaster and made a point of noticing signal 78 to be "on"; returning at once, as the stationmaster was not in the office, he saw it still to be at danger when he entered the third coach and was surprised when the train started almost immediately. Looking out he saw the signal still against it, but the train gathered speed and before he had decided what to do he saw the light engine and felt the brake application.

A signalling sub-inspector tested all the equipment as soon as possible and found everything in proper order.

Inspecting Officer's Conclusion

The electric train started against the signal at danger and no blame rests with the signalman. Calculations showed that the route for the engine must have been set before the train left and there was no

question of the signalman having made any last minute alterations. The motorman, who admitted he did not look at the signal on receiving the station staff's hand signal, must accept full responsibility for this accident. He stated that he made the mistake of looking back after testing the brake without observing the signal and started without further thought. Owing to the curvature and the wagons in the siding he was close to the engine before he saw it but managed to reduce speed from 30 to about 20 m.p.h. He is 59 with 43 years' service, driver and motorman for 20 years, with unblemished record.

The rules are quite clear on this matter and the station staff cannot be criticised for giving the hand signal to the motorman. The guard should have kept a good look-out when leaving; dealing with the tram delayed him in attending to other duties, but his action in permitting the passenger to travel with it is considered justified in the circumstances. The relief clerk was no doubt in a difficult position; he was unable to know whether or not the motorman had made a mistake and Brigadier Langley does not blame him for not pulling the communication cord.

Remarks

Several accidents have been caused by trains starting against starting signals after the driver has accepted the guard's "right away." From time to time consideration has been given to altering the rules to require the guard to satisfy himself that the fixed signal is at clear before giving his own signal, but this would imply a measure of dual responsibility for observation of signals which might cut across the long established rule that this is the fundamental responsibility of the driver. Brigadier Langley does not recommend any alteration to Rules 141 and 143, which are clear and concise, but the psychological effect of the guard's "right away" is great and drivers have on occasion allowed themselves to be misled by it. It is desirable therefore that guards and station staff should, wherever practicable, wait until the fixed signal is at

clear before giving the "right away." This procedure is no doubt normally adopted but cannot be made universal; there are many stations where the starting signals cannot be seen by the guard and a number where station staff also have difficulty. It is recommended therefore, that conditions at these stations be reviewed to see whether they can be improved, especially at busy junctions. Staines is a place where the present difficulty can be overcome by placing an aspect of the signal concerned in the centre of the platform. Since there is an electrically worked repeater at the Windsor end it should not be difficult to add an indicator to its circuit and Brigadier Langley recommends that this be done.

Opening of Apprentice Training Centre at Acton Works

The apprentice training centre at the Acton Works of London Transport Underground was opened on August 7 by Sir John Elliot, Chairman of London Transport Executive, who unveiled a plaque in the entrance lobby of the centre to commemorate the occasion.

The ceremony was attended by representatives of the Executive, the various mechanical, civil engineering departments of London Transport railways and road services, the Borough of Acton, and the trade unions.

Mr. A. W. Manser, Chief Mechanical Engineer (Railways), L.T.E., introducing Sir John Elliot, paid tribute to the foresight of London Transport in sanctioning the centre, to the design of the Architect to the Executive, Mr. T. R. Bilbow, and to the work of the main contractor, Chas. Booth & Sons (Contractors) Ltd. He also praised the co-operation between the Executive and the trade unions.

Sir John Elliot stated that the small building was of very great importance to the L.T.E. because of the continuous need for good skilled craftsmen. Despite the wider application of mechanised processes to railway engineering, he added, skilled

work still would be needed in a great degree. Mr. Manser then invited Sir John Elliot to unveil the plaque.

Training Facilities

The centre is a single-storey building, which can accommodate some 25 apprentices, mostly in their first year of training; it enables instructional facilities for apprentices undergoing training at Acton Works to be brought together in one place, instead of training taking place in different shops of the works. The structure is divided into a workshop, lecture room, locker and wash rooms, supervisor's office, and waiting room.

The workshop has a large amount of glass in the walls, which causes it to be well lit by daylight; the artificial lighting is fluorescent. Equipment installed includes fitting benches, vice stands, machine tools, grinders, a forge, and gas muffle.

Those present at the opening ceremony included:—

London Transport Executive: Sir John Elliot, Chairman; Mr. Anthony Bull, Member;

Department of Chief Mechanical Engineer (Railways): Messrs. A. W. Manser, Chief Mechanical Engineer (Railways); G. S. Bingham, Mechanical Engineer (Works, Railways); I. W. Standring, Mechanical Engineer (Lifts and Escalators); L. R. Cotton, Divisional Depot Engineer (Railways); E. P. Lumley, Divisional Depot Engineer (Railways); E. G. Brunker, Plant Engineer (Railways); C. I. Birkbeck, Progress and Planning Engineer (Railways); G. Clark, Production Engineer (Acton Works); E. Webster, Principal Development Assistant (Railways); R. C. Baughan, K. Norman, H. Seabrook, R. Stobbs and B. Williamson;

Department of Chief Civil Engineer: Messrs. C. E. Dunton, Chief Civil Engineer; A. C. Edrich, Civil Engineer (Maintenance); J. H. F. Read, Principal Heating & Ventilating Assistant;

Department of Architect: Messrs. T. R. Bilbow, Architect; A. V. Elliott, Principal Assistant Architect;

Department of Chief Mechanical Engineer, Road Services: Messrs. A. A. M. Durrant, Chief Mechanical Engineer (Road Services); J. W. Wicks, Works Manager (Buses & Coaches);



Sir John Elliot, Chairman of L.T.E., with Mr. A. W. Manser, Chief Mechanical Engineer (Railways), after unveiling the tablet at Acton Works Apprentice Training Centre



After the opening ceremony: Sir John Elliot talking with an apprentice in the workshop of the training centre; the Apprentice Supervisor, Mr. B. Williamson, is on the left

Other Officers of L.T.E.: Messrs. P. G. James, Chief Financial Officer; T. S. Pick, Chief Electrical Engineer; F. H. Spratling, Chief Establishment Officer; R. Dell, Signal Engineer; Dr. A. W. Gilks, Medical Officer in Charge (South West Division); Mr. K. R. Thomas, Staff and Welfare Officer;

Other Guests: Lady Williams, Reader in Social Economics, Bedford College, University of London; Alderman T. W. Newson, Chairman, Acton Borough Education Committee; Councillor E. W. J. Everett, Acton Borough Council; Messrs. W. F. Giddings, Principal, Acton Technical College; F. W. Booth, Director, Chas. Booth & Sons (Contractors) Ltd.

Railbuses in Bedford Area of London Midland Region

Diesel railbus services between Bedford and Northampton and between Bedford and Hitchin were introduced on Monday, by London Midland Region of British Railways. The railbuses—built by Park Royal Vehicles Limited—four-wheel vehicles each with seats for 46 passengers are described elsewhere in this issue. They replace steam trains on these routes and will provide faster and more frequent services.

To mark the occasion one of the three railbuses which will be used to operate the services conveyed His Worship the Mayor of Bedford, Alderman A. A. Jones, and Mr. R. L. E. Lawrence, Divisional Traffic Manager, London Area, London Midland Region, on a demonstration run between Bedford and Shefford. The party also included other civic dignitaries, local industrialists and traders, and other railway officials.

Improved Services

With the introduction of the new winter time-table on September 15, the railbuses will offer an improved service but until then they will operate to existing steam train schedules. Compared with last winter's time-table eight new services will operate daily between Bedford and Northampton bringing the daily total up to 18, nine in each direction. Also services which operated last winter have been retimed to save from 2 to 9 min. on overall journey time.

On the Bedford-Hitchin branch, similar improvements have been planned. From September 15, 14 daily services, seven in each direction, will be operated compared with eight daily services, four in each direction, last winter. Retimed services on this branch will save from 4 to 12 min.

The three vehicles will be stationed at Bedford Motive Power Depot. To train staff to drive and maintain the vehicles two steam engine drivers and two fitters from the depot have been given instruction at the Region's Diesel Training School at Derby and at the works of Park Royal Vehicles Limited. These men are now instructing other Bedford staff. Eventually all staff who will be called upon to drive and maintain diesel vehicles will be given courses of instruction at the Derby Diesel School.

SCOTTISH REGION ASSURED ARRIVAL SERVICE.—The Scottish Region of British Railways on April 8 introduced for freight train traffic an "assured arrival service" in each direction between Glasgow and Aberdeen and Dundee; this was extended to Inverness and Elgin as from July 7.

Parliamentary Notes

Letters on Nationalised Industries

Mr. R. A. Butler, as Leader of the House of Commons, stated on July 30 that there were some doubts in the minds of Members after the decision of the House in the debate on the report of the Committee of Privileges. On one matter he thought it would be helpful if the speaker gave the House the benefit of his advice. He understood that the Clerks at the Table had advised Members who had approached them on subjects affecting the day-to-day administration of their activities, to send letters to the nationalised boards on such questions.

The speaker (Mr. W. S. Morrison): The advice by the Clerks at the Table is unofficial and is offered in a spirit of helpfulness. Hitherto, a Member submitting an inadmissible question has been advised to write to the board concerned, or to try to raise the matter on the adjournment. Since the decision on July 8 [that the writing of a letter to a Minister on nationalised industry matters is not a proceeding of Parliament and privileged] it has been thought prudent for the Clerks not to say anything to Members about writing to Ministers or boards. This is merely a precaution against the possibility of Clerks being involved in any dispute. It is not intended to give any advice against writing letters, and no doubt Members will exercise their discretion as hitherto.

Mr. Butler then stated that as to Members' letters to Ministers, a recent vote of the House decided one particular question, namely, that the letter [to the Minister of Power] from the Member for Vauxhall (Mr. G. R. Strauss) was not a proceeding in Parliament, but it emphasised the individual responsibility of all Members to exercise the greatest care in writing to Ministers and to chairmen of nationalised boards. As to what Ministers did with the letters they received, it was in the interests of everyone that the public and Members should feel free to make a proper complaint about the administration of public services, but many criticisms could not be satisfactorily investigated without passing on the letter, or its contents, to the bodies immediately responsible. Ministers might pass on the contents of their letters and, if necessary, the letters of their constituents, to bodies outside the Government service. Ministers used every care in investigating complaints. Departments were being reminded by the Prime Minister of the need to exercise great discretion and to handle letters in the most circumspect manner.

West London Air Terminal

Colonel A. J. McKibbin (Belfast East—U.U.) in the course of a question on July 30 suggested that the West London Air Terminal be connected with Gloucester Road Underground Station (served by the District, Inner Circle, and Piccadilly Lines) by a covered "travelator" from the boundary of the air terminal to the west end of the station.

Mr. G. R. H. Nugent, Parliamentary Secretary to the Ministry of Transport & Civil Aviation, said that they could not undertake any costly installation at that point until final decisions had been taken by the Minister on the future travel arrangements between London Airport and Central London.

In reply to Mr. F. Beswick (Uxbridge—Lab.), who complained of the lack of connection between the air terminal and the

Underground at Gloucester Road, Mr. Nugent said he thought L.T.E. had done its best, but that he would further examine the matter.

Questions in Parliament

Victoria Line Tube

Mr. Ernest Davies (Enfield E.—Lab.) asked the Minister of Transport & Civil Aviation on July 23 what conclusion he had now reached in regard to the construction and financing of the projected Victoria line tube.

Mr. Harold Watkinson: It has not yet been possible to allocate to this project any of the capital available to the Commission. The line would be costly to construct and has no prospect of paying its way. It would, however, make a valuable contribution to London travel and I intend to keep the project under review with the Commission with the object of including it in its programme as soon as resources permit.

Mr. Davies: In view of the experience gained during the bus strike, when the Underground was used to far greater capacity and thereby relieved surface traffic considerably, construction of this tube would bring very considerable relief to traffic congestion in London. Therefore it deserves to be given the utmost possible priority, despite the heavy cost, because, in the long run, it would probably be worth while.

Mr. Watkinson: I am certainly anxious to keep it under review, because I do know of its traffic importance.

Later Mr. Watkinson added that the B.T.C. had a very large capital investment programme, and that they had only recently accelerated that portion of it which appeared to bring the quickest and most profitable return. The Victoria Tube scheme did nothing but increase the Commission's loss.

Staff and Labour Matters

Busmen's Wages

At a meeting of the National Council for the Omnibus Industry on August 8, 1958, further consideration was given to the claims of the trade unions for increases in wages, alterations and improvements in working conditions, and the introduction of a pension scheme for staff in the provincial bus industry employed by private bus companies and in undertakings controlled by the British Transport Commission.

At this meeting the employers made an offer of an increase of 5s. a week on basic rates of pay and improvements in certain working conditions. The offer was not acceptable to the unions and was withdrawn.

The employers' suggestion that the claims be submitted to the Industrial Court was rejected by the unions which intimated that they would refer them to the Minister of Labour for arbitration by the Industrial Disputes Tribunal.

ANNUAL REPORTS OF LICENSING AUTHORITIES.—A summary of the annual reports of the Licensing Authorities under the Road & Rail Traffic Act of 1933 includes reference to favourable comment on the continued activities of local Road/Rail Negotiating Committees in promoting agreements between applicants and objectors before applications reach the inquiry stage.

Contracts and Tenders

Main-line diesel-hydraulic and diesel-electric locomotives for British Railways

The British Transport Commission has placed orders for 83 main-line diesel locomotives in connection with British Railways modernisation programme. North British Locomotive Co. Ltd., will build 33 2,000-h.p. Type "4" diesel-hydraulic locomotives, and 20, 1,100-h.p. Type "2" diesel-electric locomotives, and the English Electric Co. Ltd. will build 30, 2,000-h.p. Type "4" diesel-electric locomotives.

The 33 locomotives of 2,000 h.p. with hydraulic transmission, are for use in the Western Region and will be introduced from early 1960 on heavy passenger and freight trains between London and the West of England. Deliveries of the diesel-electric locomotives, of both power ranges, will begin in 1959. The locomotives will be allocated to areas now being selected where the early introduction of diesel traction is expected to have the greatest economic effect.

The British Transport Commission, South Wales Docks, has placed the following contracts:—

Stelcon (Industrial Floors) Limited: Supply and paving of No. 1 section, South Quay, Newport Docks

G. Percy Trentham Limited: construction of sub-structure and associated works for new transit shed, South Dock, Newport

Scottish Cables Limited: supply of h.t. and l.t. cables for sub-station and quay, North Dock, Newport.

British Railways, Southern Region has placed the following contracts:—

Wesi's Piling & Construction Co. Ltd., West Drayton, Middlesex: foundation piling, Walworth Road Coal Depot reconstruction

Walter Kidde Co. Ltd., Greenford, Middlesex: installation of automatic fire protection, Factory Junction, Ramsgate, and Margate signalboxes

C. & T. Painters Limited, London, N.W.10: internal painting, Eastleigh Carriage Works

W. & J. Glessop Limited, Exeter: resurfacing and surface dressing of roads, footpaths, and station platforms, Exeter District

W. H. Gaze & Son Ltd., London, S.W.15: resurfacing and surface dressing of footpaths and platforms, London (Eastern) District

Johnson Bros. (Aylesford) Ltd., Tonbridge, Kent: resurfacing and surface dressing of roads, footpaths, and platforms, Ashford District

Limmer & Trinidad Lake Asphalt Co. Ltd., Eastleigh, Hants: resurfacing and surface dressing of roads, footpaths, and platforms, Eastleigh District

Campbell & McGill Limited, Winchester, Hants: reconstruction, Burghclere, Cattle Creep Bridge

Mould & Blaydon Limited, Ewell, Surrey: installation of central heating and hot and cold water services, Tadworth Police Training School

Brightside Heating & Engineering Co. Ltd., Southsea, Hants: installation of gas central heating, hot water services, gas services, external water, and gas mains, Chichester Station

P. & M. Contractors Limited, London, S.W.1: renovations, Slinfold Station

Redpath Brown & Co. Ltd., London,

W.C.2: fabrication and erection of steelwork, Walworth Road Coal Depot reconstruction

Campbell & McGill Limited, Winchester, Hants: reconstruction, Basingstoke Station Bridge

Clerk & Fenn Limited, London, S.W.4: renovations, Rex House Travel Centre, Lower Regent Street.

British Railways, North Eastern Region, has placed the following contracts:—

Ridgeway Limited, Darlington: fabrication and erection of steelwork for additional accommodation, Darlington Faverdale Wagon Works

W. & J. R. Watson Limited, Edinburgh: earthworks, and widening of bridges, Alne-Pilmoor East Coast main line

W. G. Search Limited, Leeds: four air compressors for North Eastern Region Consolidated Pneumatic Tool Co. Ltd., Gateshead: four air compressors for North Eastern Region.

The Special Register Information Service, Export Services Branch, Board of Trade, has received calls for tenders as follows:—

From Thailand:

40 all-steel bogie tank wagon underframes complete with coupling device, bogies, brake device, and riggings, welded type as shown in RSR drawing No. GM10-1004

40 all-steel bogie tank wagon underframes complete with coupling device, bogies, brake device, and rigging, riveted type as shown in RSR drawing No. 6GM10-1001.

The issuing authority and address to which bids should be sent is the Thai Technical & Economic Committee, 962, Keung Kasem Road, Bangkok. The tender No. is RSR-TTEC-204. The closing date is September 16, 1958. The Board of Trade reference is ESB/19591/58.

70 four-wheel, all-steel underframe, salt wagons with coupling device, brake device, and rigging, running gear and other component parts without all wooden parts for car body, door, and so on; metre gauge.

The issuing authority is the State Railway of Thailand. The tender No. is B.E. 2501/1958. Bids should be sent to the Stores Superintendent, State Railway of Thailand, Bangkok. The closing date is October 15, 1958. The Board of Trade reference is ESB/17626/58.

6 locomotive couplers
2 locomotive draw bars
150 locomotive wheels.

The issuing authority is the Thai Sugar Organisation. The closing date is August 27, 1958. Bids should be sent to the Ministry of Industries, Vang-Daeng, Thailand, with a deposit of Bht. 15,000. The Board of Trade reference is ESB/19592/58.

From Formosa:

1,000 tonnes of rails, 37kg., 15 or 25m. lengths.

The issuing authority is the Central Trust of China, Purchasing Department, 68 Yen Ping Nan Road, Taipei, Taiwan (Formosa). The tender No. is 84-33-427-6-80201. This purchase will be financed by the International Co-operation Admin-

istration (I.C.A.), the agency through which the United States Government gives economic and technical assistance to other countries. The closing date is August 30, 1958. The Board of Trade reference is ESB/19740/58/I.C.A.

Further details regarding the above tenders, together with photo-copies of tender documents, can be obtained from the Branch (Lacon House, Theobalds Road, W.C.1.).

The Director General, India Store Department, Government Building, Bromyard Avenue, Acton, London, W.3, invites tenders for the supply of tyres for W.G. locomotives, and manganese steel liners for axleboxes. See Official Notices on page 204.

The City of Sheffield Sewage Disposal Department invites tenders for the supply of steel side-tipping railway wagons of 420-cu. ft. capacity for standard gauge track. See Official Notices on page 204.

Notes and News

French National Railways Electrification.

The high speed of over 200 m.p.h. attained on the French National Railways was on lines electrified at 1,500 V. d.c., and not as stated in the article on co-operation in railway research on page 152 of last week's issue.

Institution of Locomotive Engineers.

Mr. Robert Arbuthnott will give his Presidential Address to the Institution of Locomotive Engineers at the Institution of Mechanical Engineers, 1, Birdcage Walk, Westminster, S.W.1, at 5.30 p.m. on Wednesday, September 17.

Derailment at Borough Market Junction.

Charing Cross and Waterloo Eastern Stations, Southern Region, British Railways, were closed for 13 hr. last Tuesday after the derailment of two coaches of the 6.52 a.m. train from Sanderstead to Cannon Street, at Borough Market Junction, near London Bridge. Two steel bridges over which the train was passing were damaged, but repairs were carried out during the day and services were back to normal for the Wednesday morning peak period. Six passengers were injured, but none seriously.

Passenger Service Withdrawn from South Wales Branch.

British Railways, Western Region, has announced the decision to withdraw the passenger train service between Pantyffynnon and Brynamman West on and from August 18. The present service over this 6½-mile branch is weekdays only. The following stations and halts will be closed to passengers: Ammanford, Ammanford Colliery Halt, Glanamman, Garnant, and Brynamman West. Regular bus services operate in the area.

Diesel Trains on Oban Line.

Last Monday and Tuesday, as an experiment, arrangements were made for the 12 noon steam train from Glasgow Buchanan Street to Oban to be replaced by a five-car diesel train, including a miniature buffet in the second vehicle, and for the 5.15 p.m. train from Oban to Glasgow to

be worked by the same diesel train. The purpose of the experiment was to see if this type of unit could in due course provide the passenger services on the Oban branch. The Scottish Region of British Railways has arranged by means of a questionnaire to ascertain the views of passengers, particularly those who live or work between Glasgow and Edinburgh and Oban.

Dismissals Caused by Fall in Freight Traffic.—The German Federal Railway announced last week that it was preparing to dismiss 5,000 employees because of reduction in freight traffic of 12 per cent in the first six months of the current year.

European Convention on International Transport Workers.—Holland is the second country to register with the International Labour Office ratification of the European convention concerning the social security of international transport workers. Poland ratified in January. The convention comes into force next October. The aim is to ensure that international transport workers receive the benefits of social security when, during their duties, they find themselves in another country. They are specifically covered for sickness, accidents, occupational diseases, and death. The convention applies to railway, road transport, aviation, and inland navigation transport employees.

Sir Brian Robertson Inspects Southern Region Modernisation Works.—Sir Brian Robertson, Chairman of the British Transport Commission, recently inspected modernisation works in the Southern Region. These included work in connection with electrification of the Kent Coast main line, the first phase of which is due for completion next June. Gatwick Airport Station and the Hastings diesel-electric servicing installations were also visited during this tour. The accompanying illustration shows Sir Brian Robertson at Newington, on the Kent Coast line between Gillingham and Sittingbourne, accompanied by Sir Philip Warter, Chairman, and other Members of the Southern Area Board: Mr. C. P. Hopkins, General Manager; and officers of the Region: (left

to right): Mr. J. Macnaughton Sidey and Mr. J. E. Binks, Members, Southern Area Board; Mr. A. H. Cantrell, Assistant Civil Engineer; Sir Brian Robertson; Mr. C. P. Hopkins; Sir Philip Warter; and Mr. S. A. Fitch, Chief Operating Superintendent.

Railway Signal Co. Ltd. Change of Address.—The London office of the Railway Signal Co. Ltd. has been moved to 96, York Way, Kings Cross, London, N.1; tel.: Terminus 8581. Mr. E. J. Beavan remains the company's London representative.

Alfred Herbert Limited Interim Dividend.—The interim dividend of Alfred Herbert Limited, machine tool manufacturers, is 2 per cent, free of tax, on capital increased to £10,923,750 by a one-for-one free scrip issue, equivalent to the previous 4 per cent on the old capital. The total for the year ended October 31, 1957, was 12 per cent, tax free, equivalent to 6 per cent on the present capital.

Transistorised Information Announcement Equipment.—In our issue of July 25, reference was made to the fitting of experimental transistorised fluorescent lighting in seven first class coaches now running in the five sets of vehicles forming the "Caledonian" express running between Euston and Glasgow Central. These sets are also fitted with loudspeaker equipment using transistor amplification manufactured by Clifford & Snell Limited. This is understood to be the first time that public service vehicles have been fitted with this type of equipment.

Bristol Railbus Inspected at Marylebone.—The first of two railbuses to be built for British Railways by Bristol Commercial Vehicles Limited and Eastern Coach Works Limited, both members of the Tilling Group of companies, was inspected by members of the technical Press at Marylebone yesterday (Thursday). This four-wheel vehicle has a number of features not previously seen in vehicles of this type including a Gardner 112-h.p. engine, resilient wheels, and disc brakes based on the Dunlop Monitor Brake System. This is stated to eliminate wheel

locking on wet or dry rails; the optimum braking effect is obtained by means of a "monitor" wheel rim brake shoe which controls the main braking effect through the disc type brakes. This also has the advantage of ensuring that the wheel rims remain clean for track circuiting. The unladen weight is about 13½ tons, and the overall length 42 ft. 7 in. Seating is arranged for 56 passengers. A central entrance gives access to two saloons; construction of the railbuses is based largely on the experience of both companies in building road passenger service vehicles.

Powell Duffryn Limited Results.—The consolidated trading profits of Powell Duffryn Limited for the year ended March 31, 1958, amounted to £2,032,709 (£2,199,237). After deducting £969,046 (£1,176,398) tax, the consolidated net profit for the year was £1,063,663 (£1,038,433), to which was added a transfer from taxation reserve of £150,000 (£178,000), making a total consolidated net profit of £1,213,663 (£1,216,433). A final ordinary dividend of 10 per cent has been recommended, making 16 per cent for the year.

Visitors to Britain During May.—Overseas visitors to the United Kingdom in May amounted to 111,800, an increase of 7 per cent over the total for May last year. A slight decrease in traffic from Europe, due mainly to a fall in the numbers of French visitors resulting from the political situation in France, was offset by substantial increases from the United States, South America, and Germany. There were 34,400 visitors from the U.S.A., 26 per cent more than in May, 1957, when the total was 27,300. European traffic amounted to 41,400, a decrease of 3 per cent compared with the same month last year.

Slough Station Waiting and Refreshment Room Modernised.—Work is now in progress at Slough Station, Western Region, on the complete reconstruction and reorganisation of the existing refreshment and waiting rooms on No. 6 Platform. The new combined refreshment and waiting room will be entered through a large plate glass doorway, and wide windows will show to advantage the terrazzo floor and the walls finished in mosaic tiling and ebony boarding. Other features include a sound-absorbing ceiling and a mirror, 20 ft. long × 4 ft. deep, placed over the service counter. The project has been designed for the Hotels & Catering Service by the Architect's section of the Chief Civil Engineer's Office, British Railways, Western Region, under the direction of the Regional Architect, Mr. H. E. B. Cavanagh. The general contractors are Charles Spreckley & Co. Ltd.

Holman Group Changes.—The merging of activities and interests within the Holman Group of Holman Brothers Limited and Climax Rock Drill & Engineering Limited has proceeded over the last six months. By re-siting manufacturing units and centralising administration at Camborne, Cornwall, the headquarters and centre of production, overlapping has been eliminated. Changes are also taking place in some of the main branches of the group in the United Kingdom. The address at 44, Brook Street, W.1, the London office of Holman Brothers Limited, has also become the London office of Climax Rock Drill & Engineering Limited, which has moved from 4, Broad Street Place, E.C.2. In



Sir Brian Robertson with Sir Philip Warter and Mr. C. P. Hopkins on new platform at Newington Station, during inspection of Southern Region Kent Coast line (see our issue of November 8, 1957)

Scotland larger premises have had to be taken on behalf of both companies. The Holman office, formerly at Elmbank Street, Glasgow, and the Climax office, at Cathedral Street, Glasgow, will have their common home at 20/26, Ashton Lane, Glasgow, W.2.

North British/G.E.C. Type "1" Diesels for Eastern Region.—Delivery is now in progress of 10 800-h.p. Type "1" diesel-electric locomotives built by the North British Locomotive Co. Ltd. for British Railways, Eastern Region. These Bo-Bo locomotives have a service weight of 68 tons. Electrical equipment is by the General Electric Co. Ltd. They are intended for freight train working in the London area, including inter-Regional services to Hither Green and New Cross Gate, and parcels trains between Liverpool Street and Southend. The diesel engine is a Paxman pressure-charged 16-cylinder Vee-type 1 YHXL which is set at 800 h.p. at 1,250 r.p.m. Tractive effort is 42,000 lb. maximum, and 20,000 lb. continuous; maximum designed speed is 60 m.p.h.

Thomas De La Rue & Co. Ltd. Results.—The group profit for the year ended March 31, of Thomas De La Rue & Co. Ltd., before taxation, amounts to £1,468,516, compared with £1,181,878 for the previous year. Taxation absorbs £918,648, leaving a balance of £549,868, out of which the interest of outside shareholders, amounting to £91,544, has been deducted, leaving profit attributable to the company of £458,324. Profits retained in subsidiaries amount to £60,060 and dividends absorb £196,420, leaving a surplus of £201,844, compared with £307,792 for the previous year, which has again been carried forward. The chairman, Mr. B. C. Westall, states that, as has been the case with most manufacturing companies, the results reflect increased sales but lower margins of profit.

Braithwaite & Co. Engineers Ltd. Results.—The ordinary dividend of Braithwaite & Co. Engineers Ltd., for the year ended March 31, is maintained at 8 per cent, with a final payment of 4 per cent. The directors are also paying a special capital distribution of 2 per cent from a capital surplus of £277,639 arising on the sale of shares in the Indian company. Group trading profits before tax were £133,458 (compared with £123,451) to which was added a dividend from the Indian company of £23,173 (£61,770). The directors point out that the dividend received was on the balance of the shareholding. The proceeds of the sale were remitted from India last October and were therefore only available for purposes of the company's trade for part of the year. Net profits worked out to £70,981 (£80,821) after a tax of £85,650 (£104,400).

Type Test of Lister Blackstone Twin Bank Engine.—An official type test, in accordance with the recent British Standard No. 2953:1958 "Diesel Engines for Rail Traction," has been completed satisfactorily by a Lister Blackstone ERS 12 T twin-bank diesel engine. The test was conducted by Livesey & Henderson, consulting engineers, London, and was at traction ratings of 1,100 b.h.p. continuous and 1,200 b.h.p. intermittent. The range of twin-bank engines is designed to use moving parts standard to the ERT and ERST in-line designs of which the ERGT version is installed in standard



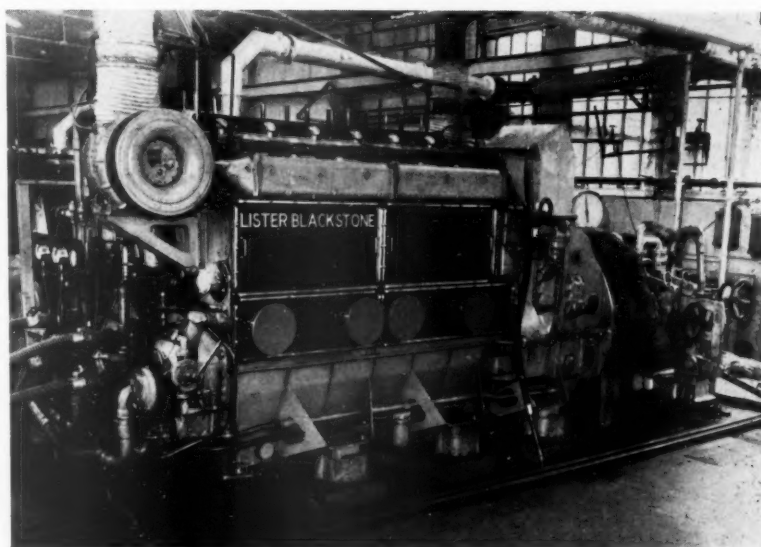
One of 10 N.B.L./G.E.C. 800-h.p. Type "1" diesel-electric locomotives being delivered to the Eastern Region of British Railways

350-h.p. British Railways diesel-electric shunters. The main features of the twin-bank range were described in our issue of September 6, 1957.

Developments of Ruston & Hornsby Diesel Engines and Locomotives.—In the annual report of Ruston & Hornsby Limited for the year ended March 31, 1958, Mr. W. Ruston, Chairman, mentions the introduction during the year of further models of diesel engines, particularly of the smaller air-cooled type. These, he states, are already proving efficient and popular in many markets. Further models of modern design, both air-cooled and water-cooled, will be introduced during the current year. Development of improved models of large engines has been continued and two new prototypes have been tested during the year. Considerable development continues in the range of diesel locomotives where, again, new models have been successfully placed on the market and further new designs will be completed during the current year. These developments include the introduction of new transmissions with

torque converters. Here, it is pointed out, the trend of demand is changing and the emphasis has swung over from the small to the larger sizes of locomotives. The financial results were given on page 30 of our July 4 issue.

J. Stone & Co. (Charlton) Ltd. Magnesium-Base Alloys.—J. Stone & Co. (Charlton) Ltd., members of the J. Stone (Holdings) Group, has introduced new magnesium-base alloys containing silver, rare earth metals, and zirconium. These are designated M.S.R. alloys; there are two variants, M.S.R. (A) and M.S.R. (B). They are distinguished by proof stress values previously obtained only with aluminium-base alloys. The properties are developed by a two-stage heat treatment, a variety of combinations of proof stress and elongation being possible by adjustment of heat treatment conditions or composition, or both. Proof stresses up to 13½ tons per sq. in. are attainable with a low ductility, but castings are at present offered in material conforming to two tentative specifications, which allow for proof stresses



ERS 12T twin-bank engine coupled to dynamometer on test at Lister Blackstone works at Stamford

in A and B type materials of not less than 10 and 11 tons per sq. in. The alloys are suitable for engine and other castings subject to long term heating. They are stated to have good casting qualities and to be fully weldable.

Motive Power Shed at Thornaby.—In the article on page 161 of our August 8 issue, it was stated that the motive power shed at Thornaby, in the North Eastern Region of British Railways, was opened in June by Mr. Harold Watkinson, Minister of Transport & Civil Aviation. Mr. Watkinson had in fact agreed to perform the opening ceremony, but was detained in London on urgent business; Mr. T. H. Summerson, Chairman of the North Eastern Area Board, deputised for him and opened the shed in his absence.

Railway Stock Market

Encouraged by the advance on Wall Street, stock markets have developed fresh strength and share values reached a new peak for the year. British Funds continued to reflect hopes of an early reduction in the Bank rate. Company results show lower earnings, but sentiment is buoyed up by the hope that the better business conditions in the U.S.A. will continue and have a stimulating effect on world trade. There is also optimistic talk in the City that, in addition to a lower Bank rate, the authorities may decide to help industry by further measures before the next Budget, such as the ending of hire purchase restrictions and cuts in purchase tax. The firmness maintained by the £ in relation to the dollar is also helping sentiment, and incidentally is one reason why American investors are increasing their demand for shares of British companies.

Canadian Pacific have been active on the strength of Wall Street and at 55½ were well maintained on balance; the preference stock gained a point at 55½, while the 4 per cent debentures strengthened afresh to 67. White Pass shares at 15 were almost at their highest for the year. Elsewhere, Mexican Central "A" bearer debentures have been well maintained at 70½.

There was better demand in evidence for Antofagasta ordinary stock, which firmed up from 14 to 14½, and the preference stock gained 1½ points at 27½. In other directions, Costa Rica ordinary stock remained at 16½ and the second debentures at 90½, Chilean Northern first debentures were dealt in up to 45½. United of Havana second income stock again changed hands around 6½. San Paulo 3s. units were quoted at 2s.

West of India Portuguese capital stock marked 78½. Guayaquil & Quito first bonds have changed hands at 90. Elsewhere, Nyasaland Railways shares transferred around 10s. 3d. and the 3½ per cent debentures at 67½.

Among shares of locomotive builders and engineers, Charles Roberts 5s. shares strengthened from 8s. to 8s. 3d., but Gloucester Wagon 10s. shares eased from 14s. to 13s. 9d. The good yield, and further consideration of the financial results, brought in buyers for Wagon Repairs 5s. shares, which at 11s. 1½d. compared with 10s. 10½d. a week ago. On the other hand, Beyer, Peacock 5s. shares lost 3d. at 8s. 1½d. Birmingham Wagon at 15s. 1½d. were virtually the same as a week ago. North British Locomotive remained around 11s. but

have been more active on attention drawn to the prospect that, in view of British Transport orders, earnings should show improvement as time proceeds.

Westinghouse Brake shares at 37s. 9d. were slightly higher on balance, and the 10s. shares of the Dowty Group, which remained under the influence of the good financial results, rose further to 35s. 6d. Moreover, there was a sharp advance in Pressed Steel 5s. shares from 14s. 9d. to 16s. 4½d.

Associated Electrical have gained 1s. 3d. at 51s. 3d. while English Electric rose from 54s. 9d. to 55s. 6d. and General Electric held their recent rise to 34s. 9d. Crompton Parkinson 5s. shares have been firm at 10s. 9d. J. Stone rose further to 61s. and there was a sharp advance to 55s. 9d. in Guest Keen on the three-for-ten free scrip issue. Stothert & Pitt shares have been active around 77s. 6d. following the directors' announcement of their plans to raise the dividend to 25 per cent and distribute a one for three scrip issue: the battle for control has not been dropped, for the directors of Spencer (Melksham) have maintained their offer to shareholders, though it is not increased.

John Brown have risen further to 29s. 4½d. on further consideration of the financial results, and Vickers held their rise to 32s. 9d., while Ruston & Hornsby rallied from 22s. 6d. to 23s. 6d. and British Timken have held firm at 45s. 3d. Elsewhere, Vokes 4s. shares were 15s. 6d. and Ransomes & Marles 5s. shares rose to 12s. 9d. T. W. Ward were firm at 78s. and Tube Investments 54s. 9d.

OFFICIAL NOTICES

CIVIL ENGINEERING ESTIMATOR required for the Newport, South Wales, office of Railway and Civil Engineering Contractors. Applicants should have wide experience of tendering for Civil Engineering Contracts and a knowledge of Railway Engineering and Estimating would be considered an advantage. The appointment offers the successful applicant excellent prospects in an expanding Company. Applications which will be treated in the strictest confidence, should state age, qualifications, experience in detail, and indication of the salary required. Write: Isca Foundry Company Limited, Newport, Mon.

THE NIGERIAN RAILWAY CORPORATION invites applications for the following posts:—

(a) **SENIOR SIGNAL AND TELEGRAPH INSTRUCTOR.** Duties: The officer will be required to prepare syllabi, organise classes and instruct apprentices in all aspects of Signal and Telegraph work as applicable to railways. Qualifications: Candidates should be about 35 years of age and be Corporate Members of the Institute of Railway Signal Engineers and A.M.I.E.E., or equivalent. They should have served a regular apprenticeship in the Signal and Telegraph Department of a Railway or with a firm of Railway Signal Engineers engaged in the manufacture and installation of Railway Signal and Telegraph appliances. Previous teaching experience of railway signalling subjects will be an advantage.

(b) **SIGNAL AND TELEGRAPH INSPECTOR.** Duties: The officer will be required to undertake the installation and maintenance of Telephone Train Control equipment, to participate in the installation and maintenance of Electric Train Staff Instruments and to assist with Double Wire Signalling Installations. Qualifications: Candidates must have working knowledge and experience of the installation and servicing of (a) General Electric Company's Telephone Train Control apparatus; (b) Railway Signal Company's Electric Train Staff Instruments; (c) Mechanical Signalling apparatus, particularly Double Wire apparatus as manufactured by the Westinghouse Brake and Signal Company.

(c) **SIGNAL INSPECTOR.** Duties: The officer will be responsible for the Signalling apparatus in a Railway district. He will also be required to undertake the installation of Double Wire Signalling apparatus. Qualifications: Candidates, not less than 28 years, must have a sound technical and practical experience in the construction, installation, repair and maintenance of mechanical signalling apparatus, including the construction and installation of Double Wire Signalling equipment. They must have served their time in the Signal Department of a first-class railway, or a signal manufacturing company.

Salary: Post (a) in scale £1,450 by £50 per annum to £1,750. Posts (b) and (c) in scale £1,000 by £50 per annum to £1,500. Starting salary according to qualifications and experience. Appointments may be on pensionable terms or on contract with a gratuity payable on completion of contract at the rate of £24 3s. 4d. to £29 3s. 4d. for post (a) and £16 13s. 3d. to £25 0s. 0d. for posts (b) and (c) for each completed month of service. The above salary scales are inclusive of Overseas Pay. Tours: 15 months in Nigeria followed by 15 weeks' leave on full pay. Quarters: Fully furnished quarters are provided at low rental. Allowances: There are attractive family, travelling, transport and other allowances. Send postcard before 5th September, 1958, mentioning the post in which interested and this paper for further particulars and application form to:—The London Representative, Nigerian Railway Corporation, Nigeria House, 9, Northumberland Avenue, London, W.C.2.

THE Director General of India Store Department, Government Building, Bromyard Avenue, Acton, London, W.3, invites tenders for the supply of:—1,600 TYRES for W.G. Locomotives. Forms of tender may be obtained from the above address on or after the 15th August, 1958, at a fee of 10s., which is not returnable. If payment is made by cheque, it should please be made payable to "High Commissioner for India." Tenders are to be delivered by 2 p.m. on Monday, 29th September, 1958. Please quote reference No. 17/58.DB/RLY.2.

THE Director General of India Store Department, Government Building, Bromyard Avenue, Acton, London, W.3, invites tenders for the supply of:—Approx. 11,500 pieces, 11 to 14 per cent. MANGANESE STEEL LINERS for Axleboxes, etc. Forms of tender may be obtained from the above address on or after the 15th August, 1958, at a fee of 10s., which is not returnable. If payment is made by cheque, it should please be made payable to "High Commissioner for India." Tenders are to be delivered by 2 p.m. on Thursday, 18th September, 1958. Please quote reference No. 16/58.DB/RLY.2.

CITY of Sheffield. Sewage Disposal Department. Contract No. B.M.(R.S.)10. Supply of STEEL TIPPING WAGONS. Tenders are invited for the supply and delivery of twelve Steel Side-tipping Railway Wagons of 420 cubic feet capacity, for standard gauge track. Forms of Tender, Conditions of Contract and Specifications may be obtained from the undersigned on deposit of a fee of three guineas which will be refunded on receipt of a bona fide Tender. Tenders, in the official envelope provided (which must bear no indication of the Tenderer), must be delivered to the Town Clerk, Town Hall, Sheffield, 1, not later than 10.0 a.m. on Friday, 12th September, 1958. JAS. H. EDMONDSON, General Manager and Engineer, General Manager's Office, Sewage Disposal Department, Wincobank, Sheffield, 9.

BOUND VOLUMES.—We can arrange for readers' copies to be bound in full cloth at a charge of 25s. per volume, post free. Send your copies to the SUBSCRIPTION DEPARTMENT, Tothill Press, Limited, 33 Tothill Street, London, S.W.1.

Forthcoming Meetings

August 20 (Wed.) to August 30 (Sat.).—Model Engineer Exhibition at the New Horticultural Hall, Westminster, S.W.1.

September 2 (Tue.).—Permanent Way Institution, Leeds & Bradford Section, in the British Railways Social & Recreation Club, Ellis Court, Leeds City Station, at 7 p.m. Paper on "American railroads," by Mr. J. Nichols, British Railways, Eastern Region.

September 2 (Tue.).—Railway Correspondence & Travel Society, Sheffield Branch, at Livesey-Clegg House, 44, Union Street, Sheffield, at 7.30 p.m. Paper on "Fifty years of Midland performance," by Mr. J. F. Clay.

September 5 (Fri.).—The Railway Club, at 320, High Holborn, London, W.C.1, at 7.30 p.m. Paper on "The great Bristol contest of 1835," by Mr. K. G. Carr.

September 5 (Fri.) to September 15 (Mon.).—Railway Correspondence & Travel Society tour of Austria.

September 6 (Sat.).—Railway Correspondence & Travel Society, South of England Branch at the M.P.D. Social Hall, Eastleigh, at 6.30 p.m. Paper on "The North London Railway," by Mr. A. P. Hancox.

